Advanced Cleaning Product Formulations

Volume 2

Ernest W. Flick

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ADVANCED CLEANING PRODUCT FORMULATIONS

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Volume 2

Reprint Edition

by

Ernest W. Flick

np NOYES PUBLICATIONS
Westwood, New Jersey, U.S.A.

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Library of Congress Catalog Card Number: 89-30274
ISBN: 0-8155-1346-1
Printed in the United States

Published in the United States of America by
Noyes Publications
Fairview Avenue, Westwood, New Jersey 07675

10 9 8 7 6 5 4 3 2

Library of Congress Cataloging-in-Publication Data
(Revised for vol. 2)

Flick, Ernest W.
Advanced cleaning product formulations.

Includes bibliographical references and index.
1. Cleaning compounds. I. Title.
TP990.F56 1989 668'.1 89-30274
ISBN 0-8155-1346-1

In Memory of

My Father and Mother

and

Aunt Elva

Preface

This book (Volume 2) presents more than 800 up-to-date advanced cleaning product formulations for household, industrial and automotive applications. It is the result of information received from numerous industrial companies and other organizations. The data represent selections made at no cost to, nor influence from, the makers or distributors of these materials. Only the most recent formulas have been included. All formulations are completely different than those contained in Volume 1, which was published in 1989.

Formulation in the cleaning product industry has gradually been undergoing significant change during the past years. Raw materials costs have risen and manufacturers have been reluctant to pass along these increases. Environmental considerations have also played a part. By changing formulations to improve cost/performance characteristics, manufacturers have been able to control costs but still enhance performance. This book presents manufacturers' suggested formulations which might meet new performance criteria.

The formulations in this book are divided into the following sections and chapters, with the number of formulations indicated in ( ):

I. Household and Industrial Cleaners and Polishes
   1. Bathroom Cleaners (29)
   2. Dairy and Food Industry Cleaners (15)
   3. Degreasers (20)
   4. Dishwashing Detergents (67)
   5. Detergents/Disinfectants (36)
   6. General Purpose Cleaners (47)
   7. Hard Surface Cleaners (60)
   8. Laundry Products (217)
   9. Metal Cleaners (87)
   10. Polishes, Coatings and Sealers (32)
   11. Rinse Aids (6)
   12. Rug, Carpet and Upholstery Shampoos and Cleaners (21)

13. Miscellaneous Cleaners (96)

II. Transportation Cleaners and Polishes

14. Auto Cleaners and Polishes (9)
15. Car and Truck Wash Compounds (38)
16. Whitewall Tire Cleaners (10)
17. Miscellaneous (19)

Each formula is located in the chapter which is most applicable. The reader, seeking a formula for a specific end use, should check each chapter which could possible apply. In addition to the above, there are two other sections which will be helpful to the reader.

III. A chemical trademark section where each tradenamed raw material included in the book is listed with a chemical description and the supplier's name. The specifications which each raw material meets are included, if applicable.

IV. Main office addresses of the suppliers of trademarked raw materials.

Each formulation in the book lists the following information, as available, in the manufacturer's own words:

- Description of end use and most outstanding properties.
- The percent by weight or volume of each raw material included in the formula, rounded to a decimal figure.
- Key properties of the formula, which are the features that the source considers to be more outstanding than other formulations of the same type.
- The formula source, which is the company or organization that supplied the formula. The secondary source may be the originating company and/or the primary source's publication title, or both. A formula number is included, if applicable.

The table of contents is organized in such a way as to serve as a subject index.

My fullest appreciation is expressed to the companies and organizations who supplied the original starting formulations included in this book. I also thank the suppliers of the raw materials included in these formulations, who furnished information describing their trademarked raw materials.

Newburyport, Massachusetts
April 1994

Ernest W. Flick

Notice

To the best of our knowledge the information in this publication is accurate; however, the Publisher does not assume any responsibility or liability for the accuracy or completeness of, or consequences arising from, such information. These formulations do not purport to contain detailed manufacturing nor user instructions, and by its range and scope could not possibly do so. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the Author or Publisher.

Some advanced cleaning products and raw materials could be toxic if used improperly, and therefore due caution should always be exercised in the use of these materials. Final determination of the suitability and reliability of any information or product for use contemplated by any user, and the manner of that use, is the sole responsibility of the user. We strongly recommend that users seek and adhere to a manufacturer's or supplier's current instructions for handling each material they use.

The Author and Publisher have used their best efforts to include only the most recent data available. The reader is cautioned to consult the supplier in case of questions regarding current availability.

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Section I

Household and Industrial Cleaners and Polishes

1. Bathroom Cleaners

Aerosol Bathroom Cleaner

Formulation E2-7258 produces a product that is used on surfaces such as ceramics or metals. When applied, this product provides the coated surface with excellent water-shedding characteristics.

Aerosol Concentrate:

Part:	Ingredients:	Percent by Weight
A	Dow Corning HV-490 Emulsion	1.5
	Isopropanol	2.6
B	Renex 698	4.1
	Dowanol DMP	4.1
	Versene Powder	6.1
	Water	81.6

Suggested Aerosol Formulation:

Ingredients:	Percent by Weight
E2-7258 Concentrate	95.0
Isobutane	5.0

Preparation:
1. Mix Part A with agitation.
2. Mix Part B separately.
3. Add Part B to Part A while stirring.
4. Pressure fill in lacquer-lined cans with Epon-coated vapor tap valves and mechanical break-up spray heads.

SOURCE: Dow Corning Corp.: Formulation E2-7258

Bathroom Cleaner

Formulations:	Wt.%
Water	86.90
Dowanol DPM (or 1:1 PnB:DPM) glycol ether	4.00
Triethanolamine	1.00
Dowcicide A1 antimicrobial	0.56
Dowfax 2A1 surfactant	0.98
Versene 100 chelating agent	5.50
Versene acid	0.30

This formulation has not been registered with the Environmental Protection Agency (EPA). Any formulation which you might choose to market with germicidal, disinfectant type claims must be registered with the EPA as required by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

SOURCE: The Dow Chemical Co.: Formula 21

Bathroom Cleaner with Hypochlorite Bleach (Mildew Remover)

Ingredients:	% by Wt.
Sodium hydroxide	1.0
Sodium metasilicate, pentahydrate	0.5
Bio-Terge PAS-8S	5.0
Sodium hypochlorite (15%)	14.0
Water, D.I.	79.5

Mixing Procedure:
Dissolve sodium hydroxide and metasilicate in water. Add remaining ingredients in the order shown above while mixing.
Properties:
Appearance: Clear liquid
pH, as is: 13.0
Viscosity @ 25C, cps: 15
Solids, %: 3.0
Use Instructions:
Use as is. Leave on surface for 1-2 minutes, then wipe with a sponge and rinse.
Performance:
Removes mildew stains and soap scum very effectively. Use on tile, grout, tub, tub walls, shower curtains, shower doors, garbage cans, and diaper pails.
Formulation No. 268

Bathroom Cleaner with Hypochlorite Bleach (Mildew Remover)

Ingredients:	% by Wt.
Sodium hydroxide (50%)	1.0
Sodium metasilicate, pentahydrate	0.5
Ammonyx LO	5.0
Sodium hypochlorite (15%)	14.0
Water, D.I.	79.5

Mixing Procedure:
Dissolve sodium hydroxide and metasilicate in water. Add remaining ingredients in the order shown above while mixing.
Properties:
Appearance: Clear liquid
pH, as is: 13.0
Viscosity @ 25C, cps: 15
Solids, %: 3.0
Use Instructions:
Use as is from a trigger spray bottle. Let react for 1-2 minutes, then wipe with a sponge and rinse.
Performance:
Removes mildew stains and soap scum very effectively. Use on tile, grout, tub, tub walls, shower curtains, shower doors, garbage cans, and diaper pails.
Formulation No. 469

SOURCE: Stepan Co.: Formulations

Bowl Cleaner (With Nonionic)

	Wt. %
Water	68.0
75% Phosphoric Acid	3.0
Surfonic N-150 (nonionic)	0.5
Tomah Acid Thickener	4.0
37% HCl	24.5

Viscosity @ 20C: 1750 cps.
pH: 1.3
SpG: 1.049 @ 74F.
Wt./Gal.: 8.74 @ 74F.

Bowl Cleaner (Nonionic/Perfume)

	Wt. %
Water	67.9
75% Phosphoric Acid	3.0
Tomah Acid Thickener	4.0
Surfonic N-150 (nonionic)	0.5
37% HCl	24.5
Cherry Almond Maskant (N-19198)*	0.1
Mint Spice Maskant (N-19197)*	
Pine/Vanilla Maskant (N-19199)*	

Viscosity @ 20C: 1750 cps.
pH: 1.3
SpG: 1.049 @ 74F.
Wt./Gal.: 8.74 @ 74F.
* Quest Intl

Phosphoric Acid Bowl Cleaner

	Wt. %
Water	77.7
75% Phosphoric Acid	12.7
Tomah Acid Thickener	4.0
Salt (NaCl)	5.0
Surfonic N-150 (nonionic)	0.5
Cherry Almond Maskant (N-19198)*	0.1
Mint Spice Maskant (N-19197)*	
Pine/Vanilla Maskant (N-19199)*	

Viscosity @ 20C: 1800 cps.
pH: 1.3
SpG: 1.049 @ 74F.
Wt./Gal.: 8.74 @ 74F.
*Quest Intl.

SOURCE: Exxon Chemical Co.: Easier Mixing Formulas

Clear Liquid Acid Bowl Cleaner

Monateric CEM-38 is stable in acid systems and can be formulated as follows:

Water	82.5-72.5%
Hydrochloric Acid 37%	15.0-25.0%
Monateric CEM-38	2.5%

Use Concentration: 4-8 ounces per toilet bowl

Acid Bowl Cleaner (9.9% active HCl)

	% by wt.
Water	66.5
HCl (37%)	26.7
Mona AT-1200	5.0
Phosphoteric T-C6	1.8

Viscosity: 200 cps

Procedure:

Mix acids into water. Add Mona AT-1200. Agitate until homogeneous. Add any other ingredients.

Liquid Household Drain Cleaner

	% by Wt
Water	89.5
Sodium Hydroxide-Flakes	9.5
Monaterge 85	1.0

Mixing Procedure:

Carefully (caution exotherm) add ingredients in the order listed with good agitation.

Liquid Household Drain Cleaner

	% Wt.
Water	88.0
NaOH (Solid)	10.0
Monafax 1293	2.0

SOURCE: Mona Industries, Inc.: Formulas

Bowl Cleaner

D.I. Water	87 parts
Anionic APS	5 parts
Muriatic Acid	8 parts

SOURCE: Burlington Chemical Co., Inc.: Formula

Household/Light Industrial Type Germicidal Acid Bowl Cleaner

Ingredients:	% by Wt.
Water	72.75
Hydrochloric acid (37% active)	21.60
Neutronyx 656	3.00
BTC 2125M (50% Active) EPA Reg. No. 1839-46	2.00
Lytron 300	0.50
Anthraquinone Blue 3G	0.05
Methyl Salicylate	0.10

Mixing Procedure:
Charge vessel with water and add acid slowly. Allow acid mixture to cool before adding remaining ingredients in order shown.

Properties:
Appearance: White, opaque liquid
pH, as is: <1.0
Density, lbs/gal: 8.50
Viscosity @ 25C: Water thin

Use Instructions:
Toilet Bowl: Add 4 ozs. to bowl
Urinals: Add 2 ozs. to urinal (48 ozs. of water)
For complete use instructions, see EPA Registered Label

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comment:
EPA Registration Number 1839-104

SOURCE: Stepan Co.: Formulation No. 88

Bowl Cleaner

	Wt. %
Water	70.6
75% Phosphoric Acid	2.0
Tomah Acid Thickener	3.0
37% HCl	24.4

Viscosity @ 20C: 5500 cps.
pH: 1.3
SpG: 1.049 @ 74F.
Wt./Gal.: 8.74 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formula

Industrial Type Concentrated Germicidal Acid Bowl Cleaner

Ingredients:	% by Wt.
Water	39.4
Hydrochloric acid (37% active)	54.1
Neutronyx 656	3.0
BTC 2125M (50% Active) EPA Reg. No. 1839-46	3.0
Lytron 300 Latex	0.5

Mixing Procedure:
Charge vessel with water and add acid slowly. Allow acid mixture to cool before adding remaining ingredients in order shown.

Properties:
Appearance: White, opaque liquid
pH, as is: <1.0
Density, lbs/gal: 9.12
Viscosity @ 25C: Water thin

Use Instructions:
Toilet Bowl: Add 2 ozs. to bowl
Urinals: Add 1 oz. to urinal (48 ozs. of water)
For complete use instructions, see EPA Registered Label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.
EPA Registration Number 1839-105

SOURCE: Stepan Co.: Formulation No. 87

Standard Bowl Cleaner

	Wt. %
9.5% HCl Solution	97.0
Tomah Acid Thickener	3.0

pH: 1.3
SpG: 1.049 @ 74F.
Wt./Gal.: 8.74 @ 74F.
Viscosity @ 20C: 5500 cps

Bowl Cleaner w/Biocide

	Wt. %
9.5% HCl Solution	96.9
Tomah Acid Thickener	3.0
Dowicil 75	0.1

pH: 1.3
SpG: 1.049 @ 74F.
Wt./Gal.: 8.74 @ 74F.
Viscosity @ 20C: 5500 cps

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Spray Cleaner

Water	94.0%
Caustic Soda Flakes	1.0%
Butyl Cellosolve	2.0%
Monamine ALX-100S	3.0%

Add ingredients in order listed.

Foaming and Cloudy Ammonia

Household ammonia	98.9%
Monamine ALX-100S	1.0%
Morton resin E-295	0.1%

Industrial Solvent Cleaner

Monamine ALX-100S	8.0%
d-Limonene	5.0%
Water	87.0%

Thorough mixing will result in a coarse, but very stable emulsion cleaner for greasy machine parts which are not attacked by the solvent.

Solvent Cleaner

	% by Weight
Water	79.5
TKPP (Powder)	5.0
Sodium Metasilicate (Anhydrous)	5.0
Monateric 1188M	4.5
Igepal CO-710 (NPE 10-11)	1.0
Ethylene Glycol Mono Butyl Ether	5.0

Procedure:

Blend Water, TKPP, and SMS together until dissolved, add remaining ingredients.

Typical Properties:

Appearance: Clear Liquid
Cloud Point: 54C
Kraft Point: <0C

SOURCE: Mona Industries, Inc.: Formulas

Tile & Toilet Cleaner

	%
Phosphoric Acid, 75% (1)	23.6
Tallow Glycinate (2)	0.5
Tallow Amine Ethoxylate (3)	1.0
Water	74.9

Tile & Toilet Cleaner

	%
Phosphoric Acid, 75% (1)	17.6
Hydrochloric Acid, 37%	13.5
Tallow Glycinate (2)	0.5
Tallow Amine Ethoxylate (3)	1.0
Water	67.4

(1) Monsanto Co.
(2) Such as Varion TEG, Sherex Chem. Co.
(3) Such as Varonic T-202, Sherex Chem. Co.

Tile Cleaner

	%
Water	72.5
Phosphoric Acid, 85% (1)	12.0
Hydroxyacetic Acid, 50%	10.0
Mazon 41	4.0
EDTA (3)	0.5
Kelzan Gum Thickener (4)	1.0

(1) Monsanto Co.
(2) Mazer Chemicals, Inc.
(3) Versene, Dow Chemical Co.
(4) Kelco Corp.

SOURCE: Monsanto Co.: Acid Cleaners: Formulas

Tile Cleaner

Water	96 parts
Hypochlorite	2 parts
Caustic Soda	1 parts
Anionic APS	1 part

SOURCE: Burlington Chemical Co., Inc.: Starter Formulations

Toilet Bowl Cleaners
Liquid

	%w
Neodol 25-12	5.0
Urea	10.0
EDTA (a)	0.5
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 5
- Phase coalescence temp., F: >176
- pH: 10.6

Solid

	%w
Neodol 25-12	10.0
PEG (1400) (b)	10.0
Urea	80.0

a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
b) Polyethylene glycol with molecular weight about 1400.

Liquid Acid Toilet Bowl Cleaners (Disinfectant)
High Quality

	%w
Neodol 25-12	3.0
Germicide (a)	5.0
Hydrochloric acid (35%) (b)	50.0
Cocoamidopropyl betaine (30%) (c)	3.0
Water, dye	to 100%

Properties:
- Viscosity, 73F, cps: 11
- Phase coalescence temp., F: >176
- pH: 1.0

Good Quality

	%w
Neodol 25-12	3.0
Germicide (a)	5.0
Hydrochloric acid (35%) (b)	20.0
Cocoamidopropyl betaine (30%) (c)	3.0
Water, dye	to 100%

Properties:
- Viscosity, 73F, cps: 7
- Phase coalescence temp., F: >176
- pH: 1.0

(a) Bardac 2250, Lonza Inc., or equivalent product.
(b) May substitute with phosphoric acid.
(c) Such as Lexaine C, Inolex Chemical Co., or equivalent

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

2. Dairy and Food Industry Cleaners

Acid Dairy Cleaner and Lime Remover

Water	35%
Nonionic surfactant (1)	5%
Phosphoric Acid (75%) (2)	60%

(1) Triton N101 or X100, Union Carbide Co.
(2) Monsanto Co.
Use level 3-6 oz./gallon. [2.3-4.7 l./100 l.]

Acid Dairy Cleaner

Deionized Water	48.4%
70% Hydroxyacetic Acid	28.6%
Phosphoric Acid, 85% (1)	10.0%
Sodium Bisulfate	5.0%
Alcohol ethoxysulfate (2)	8.0%

(1) Monsanto Co.
(2) Avanel S150, PPG or Neodol 25-3S, Shell

Liquid Milkstone Remover, Low Foam

Phosphoric Acid, 75% (1)	30-65%
Gluconic Acid	0-25%
Nonionic Surfactant (2)	1-10%
Water	q.s.

(1) Monsanto Co.
(2) Plurafac RA-43 or Pluronic 25R2, BASF, or Triton CF12 or DF12, Union Carbide

Acid Dairy & Brewery Equipment Cleaning Formulation

Phosphoric Acid, 75% (1)	50%
Dequest 2000 (50% sol.) (1)	15%
Water	35%

(1) Monsanto Co.
Use at about 1 pint/10 gal. water @ 140-160F
(1.25 l./100 l. @ 60-70C)

SOURCE: Monsanto Chemical Co.: Acid Cleaners: Formulas

Dairy Cleaners (a)
Dairy Farm Acid Liquid (b)

	%w
Neodol 25-3	1.0
Neodol 25-12	2.0
Phosphoric acid (85%)	57.3
Butyl Oxitol glycol ether	3.0
Water	to 100%

Properties:
Phase coalescence temp., F: >165
pH: 1.0
Use Concentration:
1/4-2 oz./gal.
Blending Procedure:
Add acid to water last.

Alkaline Powder (c)

	%w
Neodol 1-5	5.0
Sodium tripolyphosphate	30.0
Sodium metasilicate, pentahydrate	10.0
Sodium carbonate	40.0
Tetrasodium pyrophosphate	15.0

Blending Procedure:
Mix solid builders and filler thoroughly. Add surfactants slowly while mixing; mix thoroughly.

a) Neodol surfactants may be used as components of cleaners for food processing equipment. Since the cleaning compound is not considered a food additive, it is not subject to FDA regulations as long as it is followed by a potable water rinse.
b) Good as milkstone remover and equipment cleaner (manual application).
c) Use intended for manual application, not for circulation cleaning.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Dairy Cleaner

D.I. Water	48 parts
Hydroxyacetic Acid	28 parts
Phosphoric Acid 85%	10 parts
Sodium Bisulfate	5 parts
Anionic APS	9 parts
(Removes milkstone)	

SOURCE: Burlington Chemical Co., Inc.: Starter Formulation

Dairy Pipeline Cleaner, Medium Duty

Ingredient:	Wt. %
Sodium Tripolyphosphate (1)	30
Nonionic Surfactant (2)	1-3
Sodium Metasilicate, Anhydrous	10
Sodium Carbonate	20
ACL 60 Chlorinating Comp. (3)	2-4
Sodium Sulfate	Balance

(1) Monsanto Co. STP Code 185
(2) Such as Union Carbide Triton N-101
(3) Monsanto Co.

Dairy Pipeline Cleaner, Heavy Duty

Ingredient:	Wt. %
Sodium Tripolyphosphate (1)	45
Nonionic Surfactant (2)	1-3
Sodium Metasilicate, Anhydrous	15
Sodium Carbonate	20
ACL 60 Chlorinating Comp. (3)	2-4
Sodium Sulfate	Balance

(1) Monsanto Co. STP Code 185
(2) Such as Union Carbide Triton N-101
(3) Monsanto Co.

Manual Application Dairy Cleaner

Ingredient:	Wt. %
Neodol 25-12 (1)	5.0
C-12 LAS (60%) (2)	3.0
Sodium Tripolyphosphate (3)	35.0
Sodium Metasilicate, pentahydrate	35.0
Sodium Sulfate, decahydrate	22.0

(1) Shell Chemical Co.
(2) Witco Chemical Co. Witconate 1260 or equiv.
(3) Monsanto Co. STP Code 101

Dairy Pipeline Cleaner, Low Foam

Ingredient:	Wt. %
Triton CF-54 Surfactant (1)	5.0
Sodium Hydroxide	10.0
Sodium Silicate, Anhydrous	30.0
Soda Ash	30.0
Sodium Tripolyphosphate (2)	25.0

(1) Union Carbide Co.
(2) Monsanto Co. STP Code 101

SOURCE: Monsanto Chemical Co.: Sodium Tripolyphosphate: Formulas

Dairy Pipeline Cleaner (Powder)

Soil: Fat and protein
Surface: Stainless steel
Application Method: Clean in place
Manufacture: Ribbon or paddle blender

Composition A:	% Wt
Sodium Carbonate	30.0
STPP	25.0
*Triton DF-16	5.0
Metso Beads 2048	30.0
Sodium Hydroxide Beads	10.0

Composition B:	% Wt
Sodium Carbonate	28.0
STPP	35.0
**C12-C15 Linear Alcohol, 12 Moles EO	5.0
***Alkylaryl Sulfonate, Acid (98%)	2.0
Metso Beads 2048	30.0

Use Dilution: 0.33-1.5% bw (1/4 oz - 2 oz/gallon)
*Rohm & Haas
**Shell, Union Carbide, Vista
***Witco, Vista, Stepan

SOURCE: The PQ Corp.: PQ Formulary: Formula

Dairy Pipeline Cleaner

Triton XL-80N Surfactant	5.0
Phosphoric Acid (85%)	22.0
Water	73.0

SOURCE: Union Carbide Surfactants: Starting Formulation OF#-31

Food Industry Cleaners (a)
General Use Liquid

	%w
Neodol 23-6.5	5.0
C12 LAS (60%) (b)	5.0
Sodium metasilicate, pentahydrate	3.0
Tetrapotassium pyrophosphate	2.0
Sodium xylene sulfonate (40%)	2.0
Butyl Oxitol glycol ether (c)	5.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 4
Phase coalescence temp., F: >165
pH: 13.1

Use Concentration:
1-2 oz./gal.

Powder (d)

	%w
Neodol 23-6.5	5.0
Sodium carbonate	31.5
Sodium hydroxide, beads	21.3
Sodium metasilicate, pentahydrate	18.6
Tetrasodium pyrophosphate	23.6

Blending Procedure for Powder Only:
Mix solid builders thoroughly. Add surfactant slowly with mixing, mix thoroughly.

a) Neodol surfactants may be used as components of cleaners for food processing equipment. Since the cleaning compound is not considered a food additive, it is not subject to FDA regulations as long as it is followed by a potable water rinse.
b) Witconate 1260, Witco Corp., or Bio-Soft D-62, Stepan Co., or equivalent product may be used.
c) Shell Chemical Co.
d) Use intended for soak tank cleaner.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

3. Degreasers

Alkaline Soak and Spray Cleaners/Degreasers

Ingredients:	% wt/wt
Amphoterge KJ-2	8.0
Ethylene diamine tetraacetate tetrasodium salt (38% sol'n)	5.0
Sodium hydroxide (45% sol'n.)	20.0
Kasil No. 1	50.0
Water	17.0

Preparative Procedure:

Charge the mixing vessel with all the water. Slowly add the sodium hydroxide followed by the Kasil No. 1 and EDTA Na4. When the system is fully dissolved, add the Amphoterge KJ-2. Continue to mix until the solution is clear.

Formula Y-47-8

Heavy Duty Spray Degreaser

Ingredients:	% wt/wt
Amphoterge K-2	3.0
Ethylenediamine tetraacetic acid, tetrasodium salt (38% sol'n.)	2.5
Sodium carbonate	1.5
Sodium metasilicate pentahydrate	3.0
Carsonol SHS	5.0
Unamide D-10	1.0
Water	84.0

Preparative Procedure:

Charge all of the water to the mixing vessel. While stirring, add the sodium carbonate and sodium metasilicate pentahydrate. After these salts dissolve, add the EDTA-Na4, followed by Unamide D-10, Carsonol SHS and Amphoterge K-2. Continue to mix until the solution is clear.

Formula J-12-1

SOURCE: Lonza, Inc.: Formulas

Degreaser Concentrate (Liquid)

Soil: Grease, oil
Surface: Paint, polymeric, metal
Application Method: Spray or wipe
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	62.0
Metso Beads 2048	8.0
EDTA, Tetrasodium (37%)	10.0
*Phosphate Ester	10.0
**C9-C11 Linear Alcohol, 6 Moles EO	5.0
**C9-C11 Linear Alcohol, 2.5 Moles EO	5.0

Use Dilution: Normal Duty: 1.5% bw (2 oz/gal)
Heavy Duty: 3.0% bw (4 oz/gal)

*Mona Industries, Rohm & Haas **Shell, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formula

Degreaser Concentrates
Premium Quality for Hard Water

	%w
Neodol 91-6	5.0
Neodol 91-2.5	5.0
Sodium metasilicate, pentahydrate	12.0
EDTA (a)	10.8
Phosphate ester (b,c)	12.5
Water, dye, perfume	to 100%

Properties:
Phase coalescence temp., F: >140
pH: 13.4

Premium Quality for Medium-Hardness Water

	%w
Neodol 91-6	5.0
Neodol 91-2.5	5.0
Sodium metasilicate, pentahydrate	6.7
EDTA (a)	6.0
Sodium xylene sulfonate (40%)	15.0
Water, dye, perfume	to 100%

Properties:
Phase coalescence temp., F: >140
pH: 13.3

High Quality Concentrate

	%w
Neodol 91-6 (d)	5.0
Neodol 91-2.5 (d)	5.0
Sodium metasilicate, pentahydrate	10.0
EDTA (a)	4.0
Phosphate ester (b)	10.0
Water, dye, perfume	to 100%

Properties:
Phase coalescence temp., F: 140
pH: 13.3

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Degreaser Concentrates (Continued)
Good Quality Concentrate for High Pressure Spray System

	%w
Neodol 1-5	6.0
Sodium metasilicate, pentahydrate	3.0
EDTA (a)	3.0
Sodium xylene sulfonate (40%)	10.0
Water, dye, perfume	to 100%

Properties:
Phase coalescence temp., F: 140
pH: 12.9

Blending Procedure:
Dissolve Neodol ethoxylate(s) and hydrotrope (phosphate ester or sodium xylene sulfonate) in water. Add EDTA salt and sodium metasilicate with vigorous stirring until homogeneous.

Recommended Dilutions:
Heavy-duty use: 1 part concentrate to 32 parts water (4 oz./gal.).
Regular-duty use: 1 part concentrate to 64 parts water (2 oz./gal.)

a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
b) Triton H-66, Union Carbide Corp., or equivalent product.
c) May replace phosphate ester with 17.6% sodium xylene sulfonate (40%).
d) The combination of Neodol 91-6 and 91-2.5 can be replaced with Neodol 1-5.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Heavy Duty Cleaner/Degreaser

Ingredients:	% by Wt.
d-Limonene	50.0
Ninol 11-CM	9.5
Makon 12	5.0
Ammonyx LO	0.5
Butyl Cellosolve	10.0
Water, D.I.	25.0

Mixing Procedure:
Add surfactants and butyl cellosolve to D-Limonene and mix until clear. Add water slowly while under high agitation. Mix until clear.

Properties:
Appearance: Clear yellow liquid
Odor: Citrus
pH, as is: 9.0
Viscosity @ 25C, cps: 50
Density, lbs/gal: 7.6

Use Instructions: Use as is or dilute with water.

Performance: Removes grease, tar, chewing gum, and other oily soils effectively.

SOURCE: Stepan Co.: Formulation No. 207

Heavy Duty Degreaser

Combinations of Burco TME and Burco FAE can be used to produce microemulsions with terpene solvents such as d-Limonene. This combination can also be used as an emulsifier for mineral spirits, varsol, kerosene, etc. With these petroleum solvents, microemulsions can be prepared by increasing the level of surfactants or the use of a water soluble solvent such as Burcosolv TM.

d-Limonene Microemulsions

Components:	% by Weight
d-Limonene	16
Burco FAE	11
Burco TME	11
Water	62

Dissolve Burco FAE and Burco TME in d-Limonene. Add water slowly with stirring. Mix will thicken, then thin as water add is completed.

This formulation can be concentrated to as much as twice the activity level as given above. The ratios of solvent and surfactants must remain the same. More concentrated formulations will build higher viscosity.

Aqueous degreasers can be produced using Burco TME and Burco FAE. Equal concentrations of Burco TME and Burco FAE give the optimum performance properties. Additives such as chelates, detergent polymers, and water soluble solvents can enhance the performance of the aqueous degreasers. Typical formulations are given below:

Aqueous Degreaser Formulation-A

Components:	% by Weight
Water	50.60
Burco FAE	20
Burco TME	20
TEA 85%	0-10

Aqueous Degreaser Formulation-B

Components:	% by Weight
Water	46
Burco FAE	20
Burco TME	20
Burcotreat 900-A	4
TEA 85%	10

SOURCE: Burlington Chemical Co., Inc.: Heavy Duty Degreasers: Formulas

Heavy Duty Degreasers (Continued)
Aqueous Degreaser Formulation-C

Components:	% by Weight
Water	40
Burco FAE	20
Burco TME	20
Burcosolv TM	20

Procedure:

Heat water to 65C. Add Burco FAE and stir until dissolved. Cool and add remaining components in the order listed.

Formulation A is the base formulation. TEA is an optional additive that gives some reserve alkalinity and improved flash rust inhibition.

Formulation B will have improved hard water tolerance and better soil antiredeposition properties. Formulation C will give improved removal of very heavy greases. Combinations of these variations are feasible but must be evaluated for stability.

Aqueous degreaser formulations containing the Burco TME/Burco FAE combination must be used at dilutions containing at least 2% surfactant to obtain good oil emulsification. Higher levels may be required depending on the soil.

Emulsions obtained using these products may be broken or split by acidifying the emulsion. Typically, the solution must be acidified to a pH of 4 or lower to achieve good splitting. A pH of 3 or below is preferred.

Microemulsion Degreaser

Water	To 100% Total
Burcoterge DG-40	25-50%
Butyl Propasol	10%
Mineral Spirits	0-10%

The level of Burcoterge DG-40 is adjusted according to the severity of the cleaning requirements. Petroleum solvent, such as mineral spirits, will add cleaning that often cannot be attained without the solvent. This is particularly true for soils containing waxes or high viscosity oils.

Applications for the degeaser formulations include:

- Metal Degreasing
- Removal of Oil Stains from concrete and other hard surfaces
- Ship and Tank Cleaning
- Oil Spill Emulsification

SOURCE: Burlington Chemical Co., Inc.: Heavy Duty Degreasers/ BURCOTERGE DG-40: Formulas

Non-Aqueous (Solvent) Degreaser

Component:	wt. %
Vista LPA Solvent	75.0
Alfonic 810-60 Ethoxylate	15.0
Alfonic 810-40 Ethoxylate	5.0
Water, perfume, dye	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
Approximate pH: 7.5
Cloud/clear: below 40F
Order of Addition:
LPA Solvent, ALFONIC 810-60, ALFONIC 810-40, Water

SOURCE: Vista Chemical Co.: Example Starting Formulation

Industrial Degreasing Steam Cleaner

	Wt.%
Water	81.5
Sodium Metasilicate Anhydrous	2.0
50% NaOH	9.5
Trisodium NTA	1.0
Tomah AO-14-2	1.5
Tomah Q-14-2	1.5
Nonionic Surfactant	3.0

pH: 13.0
SpG: 1.060 @ 74F.
Wt./Gal.: 8.83 @ 74F.

Butyl/D-Limonene Degreaser

Component:	Weight%
Butyl Cellosolve	15.0
D-Limonene	3.5
E-14-5	3.5
Alkali Surfactant	5.0
Nonionic Surfactant (HLB 13)	2.0
Water	68.0
EDTA	1.0
45% KOH	1.0
MEA (monoethanolamine)	1.0

Add the first five ingredients and mix well. Slowly add the water with good mixing. Continue mixing and add the remaining ingredients. Formulation should be clear.

SOURCE: Exxon Chemical Co.: Formulations

Solvent Degreasers, Flush-Off Type
High Quality for Heavy Oils

	%w
Neodol 91-8	10.0
Neodol 91-2.5	5.0
Neodol 25-3	5.0
Shell Sol 71 or 72 (a)	79.0
Water	1.0

Properties:
Viscosity, 73F, cps: 6
Phase coalescence temp., F: >176

High Quality for Regular Oils

	%w
Neodol 91-6	15.0
Neodol 91-2.5	5.0
Shell Sol 71 or 72 (a)	60.0
Butyl Oxitol glycol ether (b)	18.0
Water	2.0

Properties:
Viscosity, 73F, cps: 8
Phase coalescence temp., F: >176

Blending Procedure for Solvent Degreasers:
Add water last, and mix vigorously.
(a) Isoparaffinic solvent, b.p. 356-401F. Shell Chemical Co.; Shell Sol 140 or Shell Mineral Spirits 145, 150 or 150EC can be substituted.
(b) Shell Chemical Co.

Powder Degreasers
Caustic, Non-Phosphate

	%w
Neodol 91-6	2.5
Neodol 91-2.5	2.5
Sodium metasilicate, anhydrous	32.0
Sodium hydroxide, beads	32.0
Sodium carbonate (a)	31.0

Non-Caustic, Phosphate

	%w
Neodol 91-6	2.5
Neodol 91-2.5	2.5
Sodium metasilicate, anhydrous	30.0
Trisodium phosphate, anhydrous basis	30.0
Sodium carbonate (a)	35.0

Blending Procedure for Powder Degreasers:
Mix solid builders thoroughly. Add surfactants slowly while mixing. Mix thoroughly.
(a) May include 5%w ethylenediamine tetraacetic acid, tetrasodium salt or replace sodium carbonate with trisodium phosphate builder for enhanced quality product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

4. Dishwashing Detergents

Automatic Dishwash Detergent, Consumer (powder, dry blended)

Soil: Acidic food fat, oil and protein
Surface: Ceramic, glass and metal
Application method: Automatic dishwashing machine
Manufacture: Ribbon or paddle blender

Composition:	%Wt
Britesil H20	30.0
STPP (dense powder)	40.0
Sodium Carbonate (dense powder)	24.0
Nonionic surfactant (low foam)	2.5
Sodium polyacrylate (5,000 mw)	1.5
Sodium dichloroisocyanurate, 2 H2O	2.0

Density (lb/ft3) range: 45-62
(g/cc) range: 0.7-1.0

(*Note: Density of finished product is dependent on powdered raw materials particle size and density).

Machine Dishwashing Detergent (I and I) (Liquid)

Soil: Food grease, oil and protein
Surface: Metal, ceramic and glass
Application Method: Dishwasher (spray)
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	50.9
Acrysol ASE 108	6.9
Triton DF-16	3.0
Potassium Hydroxide (45%)	1.2
TKPP (60%)	25.0
N Clear	13.0

Use Dilution: 0.15-0.30% bw (0.2-0.4 oz/gallon)

SOURCE: PQ Corp.: PQ Formulary: Suggested Formulas

Automatic Dishwasher Detergent-Dry Mix Formulation

Raw Materials:	% by Weight
Britesil H-20 or C-20	25
Surfonic LF-37	3
STPP, anhydrous	27
STPP-6H2O	22
Inorganic Salts*	20
Sodium Dichloroisocyanurate-2H2O	3

* The inorganic salts can be sodium sulfate, sodium carbonate or a mixture of the two.

Mixing Instructions:

a) Mix the Britesil and the inorganic salts together.
b) Add the Surfonic LF-37 to the mixed Britesil-inorganic salts and mix thoroughly until the surfactant has been absorbed to the maximum extent possible.
c) Add the hydrated STPP to the resulting salt-Surfonic mixture and mix thoroughly. Then add the anhydrous STPP to the mixture and mix thoroughly.
d) Add the Sodium Dichloroisocyanurate dihydrate to the product mixture last and mix into the product.

Automatic Dishwasher Detergent-Agglomerated Formulation

Raw Materials:	% by Weight
STPP, anhydrous	34
Sodium Carbonate	19
Sodium Sulfate, anhydrous	15
Britesil C24	18
Surfonic LF-37	3
Sodium Dichloroisocyanurate-H2O	3
Water	8

Mixing Instructions:

a) Mix together the STPP, sodium carbonate and Britesil.
b) Slowly spray a mixture of the Surfonic LF-37 and water onto a well-stirred mixture of solids from step (a). Continue stirring the mixture to allow time for the surfactant to absorb and the water to partially hydrate the salts.
c) Mix thoroughly the sodium sulfate and the sodium dichloroisocyanurate. Then add this material to the stirring salt-surfactant mixture and continue to mix until a flowing, granular product.

SOURCE: Texaco Chemical Co.: Formulas

Automatic Dishwashing Detergent

Ingredients:	% by Wt.
Sodium tripolyphosphate, dense	40.0
Makon NF-5	3.0
Britesil H-20	30.0
CDB Clearon	2.0
Sodium carbonate, dense	25.0

Mixing Procedure:
Charge blender with carbonate. Add Makon NF-5 and mix for one minute. Add remaining ingredients and mix.

Properties:
Appearance: White free flowing powder
pH, 1% aqueous: 11.0

Use Instructions:
Use per dishwasher manufacturer's instructions.

Performance:
Excellent performance at low temperature, low foam and defoaming of food soils, no spotting, etching or streaking on glassware.

SOURCE: Stepan Co.: Formulation No. 311

Dishwashing (Machine) Powder

	%
Sodium tripolyphosphate, hexahydrate	44
Soda ash	20.5
Sodium metasilicate	15
Sodium sulfate	14
Poly-Tergent SLF-18	3
CDB Clearon sodium dichloroisocyanurate	1.5
Water	2

SOURCE: Olin Chemicals: POLY-TERGENT Surfactants: Formula

Automatic Liquid Dish Detergent

Ingredients:	% by Wt.
Water, D.I.	35.75
Macaloid clay	0.50
Van Gel ES	2.00
Monostearyl acid phosphate	0.30
K Sil #6	25.00
Sodium hydroxide (50%)	3.00
Sodium hypochlorite (15%)	8.00
Sodium tripolyphosphate	24.00
Bio-Terge PAS-8S	1.45

Mixing Procedure:

Add clay and Van Gel ES to water while mixing. Heat and stir for 1 hour. Cool and add defoamer. Premix K Sil #6 and sodium hydroxide and then add while mixing. Add half of phosphate and continue mixing. Add bleach. Add remainder of phosphate and lastly add Bio-Terge PAS-8S.

Properties:

Appearance: Off white, opaque, slurry
pH, as is: 12.0
Viscosity @ 25C, cps: 13000
Phosphorus, % (calculated): 6.1
Solids, %: 50.0
1 week at room temp.: Slight weeping

Use Instructions:

Fill dispenser cup completely

Performance:

Performs as well as national products.
Formulation No. 253

Automatic Liquid Dishwash Detergent

Ingredients:	% By Wt.
Water, D.I.	35.7
TKPP (60%)	33.3
K Sil #1	20.0
Sodium hypochlorite (15%)	8.0
Bio-terge PAS-8S	3.0
Sodium Hydroxide (50%)	q.s. to pH of 12.0

Mixing Procedure:

Dissolve builders in water. Add remainder of ingredients in the order given with agitation.

Properties:

Appearance: Clear liquid
pH, as is: 12.0
Density, lbs/gal: 10.42
Viscosity @ 25C: Water thin

Use Instructions:

Measure into machine to give concentrations of 2 to 4 oz/gal

Comment:

If a viscous product is desired, a clay thickener can be added at levels of 1.0-5.0% prior to the addition of builders.

SOURCE: Stepan Co.: Formulation No. 25

Liquid Dishwash Detergent-Economy

Ingredients:	% By Wt.
Water, D.I.	88.1
Bio-Soft LD-190	10.9
Sodium Chloride	1.0

Mixing Procedure:
Blend ingredients in the order given. Adjust pH to 6.5-7.5 with sulfuric acid if necessary.

Properties:
- Appearance: Straw-colored, clear liquid
- Viscosity @ 25C, cps: 190-230
- pH, as is: 6.5-7.5
- Solids, %: 10-12
- Cloud point, C: <5
- Freeze/thaw, 3 cycles: Pass

Use Instructions:
Squirt a small amount into sink and fill with hot water.

Performance:
Mini-Plate Test:
- Above formulation: 12 mini-plates washed
- Palmolive control: 40 mini-plates washed

Formulation No. 20

Liquid Dishwash Detergent-Economy

Ingredients:	% By Wt.
Water, D.I.	86.1
Bio-Soft LD-190	7.7
Sodium chloride	1.3
Urea	4.9

Mixing Procedure:
Blend ingredients in order given. Adjust pH to 6.5-7.5 with sulfuric acid before addition of urea.

Properties:
- Appearance: Clear liquid
- Viscosity @ 25C, cps: 140-180
- Solids, %: 13-14
- Density, lbs/gal: 8.51
- pH, as is: 6.5-7.5

Use Instructions:
Squirt a small amount into sink and fill with hot water.

Performance:
Pellet Test:
- Above formulation: 2 pellets used
- Premium national brand: 12 pellets used

SOURCE: Stepan Co.: Formulation No. 21

Liquid Dishwash Detergent-Economy

Ingredients:	% by Wt.
Water, D.I.	76.75
Alpha-Step LD-200	17.15
Steol CS-460	2.85
Sodium Chloride	2.50
Opacifier	0.75

Mixing Procedure:

Charge water, holding back enough to predilute opacifier 4:1 water/opacifier. Add ingredients in order given above, mixing thoroughly between additions. Add diluted opacifier last. Adjust pH to 6.5-7.5 as necessary.

Properties:

Appearance: White, opaque liquid
pH, as is: 7.0
Viscosity @ 25C, cps: 150
Solids, %: 13
Density, lbs/gal: 8.61
Freeze/thaw, 3 cycles: Pass

Use Instructions:

Squirt small amount into sink and fill with hot water.

Performance:

Mini-Plate Test:
Above formulation: 13 mini-plates washed
Commercial economy dishwash: 10 mini-plates washed
Palmolive control: 40 mini-plates washed

Comment: Opacifier: Lytron 305 from Morton Thiokol
Formulation No. 558

Liquid Dishwash Detergent-Economy

Ingredients:	% by Wt.
Bio-Soft LD-150	16.30
Urea	3.75
Sodium Chloride	3.25
Water, D.I.	76.70

Mixing Procedure:

Add urea and salt to water and mix until dissolved. Then add Bio-Soft LD-150 and mix until clear and homogeneous.

Properties:

Appearance: Clear, yellow liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 150-200
Freeze/thaw, 3 cycles: Pass
Solids, %: 14-16

Use Instructions:

Squirt small amount into sink and fill with hot water.

Performance:

Mini-Plate Test:
Above formulation: 11 mini-plates washed
Palmolive control: 40 mini-plates washed

SOURCE: Stepan Co.: Formulation No. 272

Liquid Dishwash Detergent-Economy

Ingredients:	% By Wt.
Bio-Soft S-100	7.3
Sodium hydroxide (50%)	1.9
Ninol 40CO	2.4
Sodium chloride	0.8
Water, D.I.	87.6

Mixing Procedure:

Add caustic to water and slowly add S-100 while mixing. Add Ninol 40CO and salt and mix until clear. Adjust pH to 6.5-7.5 with sulfuric acid or sodium hydroxide as necessary.

Properties:

Appearance: Clear straw-colored liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 230-280
Solids, %: 10-12
Freeze/thaw, 3 cycles: Pass

Use Instructions:

Squirt small amount into sink and fill with hot water.

Formulation No. 210

Economy Liquid Dishwash

Ingredients:	% by Wt.
Alpha-Step LD-200	30.0
Sodium Chloride	1.0
Water	69.0

Procedure:

Charge water and dissolve sodium chloride.
Blend in Alpha-Step LD-200 and mix until homogeneous.
Dye and fragrance as desired.

Properties:

Appearance: Clear Yellow Liquid
pH, as is: 6.5-7.5
Solids, %: 15
Viscosity, cps: 140
Freeze/Thaw Stability: Pass
50C Stability: Pass
Use Level: Squirt small amount into sink and fill with hot water.

Formulation No. 215

SOURCE: Stepan Co.: Formulations

Economy Liquid Dishwash

Ingredients:	% by Wt.
Alpha-Step ML-A	6.5
Bio Soft D-62	15.0
Ninol 40-CO	1.5
Sodium Chloride	2.5
Water	74.5

Procedure:

Charge water. Blend in Alpha-Step ML-A and Ninol 40-CO with good agitation. Blend in Bio Soft D-62. Add sodium chloride; mix until homogeneous. Adjust pH to 6.5-7.5 with sodium hydroxide to increase or sulfuric acid to decrease.

Dye and fragrance as desired.

Properties:

Appearance: Clear Yellow Liquid
pH, as is: 6.5-7.5
Solids, %: 16
Viscosity at 25C, cps: 150
Freeze/thaw Stability: Pass
50C Stability: Pass
Use Concentration: Squirt small amount into sink and fill with hot water
Formulation No. 218

Liquid Dishwash Detergent-Intermediate

Ingredients:	% by Wt.
Water, D.I.	47.2
Stepanate SXS	1.5
Bio-Soft D-40	38.8
Steol CS-460	6.5
Ammonyx LO	6.0

Mixing Procedure:

Add ingredients in the order given above. Adjust pH to 7.0-7.5 with sulfuric acid if necessary.

Properties:

Appearance: Clear yellow liquid
pH, as is: 7.0-7.5
Viscosity @ 25C, cps: 250-300
Solids, %: 21-23

Use Instructions:

Squirt small amount into sink and fill with hot water.

Performance:

Mini-Plate Test:
Above formulation: 28 mini-plates washed
Palmolive control: 40 mini-plates washed

Comment:

Ammonyx LO not only improves the viscosity and foaming properties of the formulation but also imparts emolliency.

SOURCE: Stepan Co.: Formulation No. 468

Liquid Dishwash Detergent-Intermediate

Ingredients:	% By Wt.
Water, D.I.	62.3
Stepanate SXS	5.0
Bio-Soft LD-190	32.7

Mixing Procedure:
Blend ingredients in order given. Adjust pH to 6.5-7.5 with sulfuric acid if necessary.

Properties:
Appearance: Clear yellow liquid
Viscosity @ 25C, cps: 275-325
pH, as is: 6.5-7.5
Solids, %: 31-33
Cloud point, C: <5
Freeze/thaw, 3 cycles: pass

Use Instructions
Squirt small amount into sink and fill with hot water

Performance:
Mini-Plate Test:
Above formulation: 22 mini-plates washed
Palmolive control: 40 mini-plates washed
Formulation No. 11

Liquid Dishwash Detergent-Intermediate

Ingredients:	% by Wt.
Water, D.I.	76.6
Stepanate SXS	1.5
Bio-Soft LD-190	21.9

Mixing Procedure:
Blend ingredients in order given. Adjust pH to 6.5-7.5 with sulfuric acid if necessary.

Properties:
Appearance: Clear straw-colored liquid
Viscosity @ 25C, cps: 170-200
Solids, %: 20-21
Density, lbs/gal: 8.51
pH, as is: 6.5-7.5

Use Instructions:
Squirt a small amount into sink and fill with water.

Performance:
Mini-Plate Test:
Above formulation: 17 mini-plates washed
Palmolive control: 40 mini-plates washed

SOURCE: Stepan Co.: Formulation No. 22

Liquid Dishwash Detergent-Intermediate

Ingredients:	% by Wt.
Steol CS-460	8.0
Ninol 40-CO	3.0
Bio-Soft D-40	50.0
Water, D.I.	39.0

Mixing Procedure:
Add surfactants in the order given, mix well, then add water while agitating. Mix until homogeneous. Adjust pH to 6.5-7.5 with sulfuric acid if necessary.

Properties:
Appearance: Clear liquid
Viscosity @ 25C, cps: 225-275
Freeze/thaw, 3 cycles: Pass
pH, as is: 6.5-7.5
Solids, %: 27-29

Use Instructions
Squirt small amount into sink and fill with hot water.

Formulation No. 24

Liquid Dishwash Detergent-Intermediate

Ingredients:	% By Wt.
Water, D.I.	54.5
Bio-Soft LD-150	45.0
Sodium chloride	0.5

Mixing Procedure:
Blend ingredients in the order given. Adjust pH with sulfuric or citric acid if necessary.

Properties:
Appearance: Clear yellow liquid
Viscosity @ 25C, cps: 150-300
pH, as is: 6.5-7.5
Solids, %: 22-24

Use Instructions:
Squirt small amount into sink and fill with hot water.

Performance:
Mini-Plate Test:
Above formulation: 23 mini-plates washed
Palmolive control: 40 mini-plates washed

SOURCE: Stepan Co.: Formulation No. 136

Liquid Dishwash Detergent-Intermediate

Ingredients:	% by Wt.
Water, D.I.	46.7
NaOH (50%)	4.8
Stepanate SXS	9.5
Bio-Soft S-100	17.8
Steol CA-460	16.5
Ninol 96-SL	3.6
Kessco EGMS	0.5
Opacifying agent (Lytron 305)	0.6

Mixing Procedure:
Add ingredients in order given. Adjust pH to 6.5-7.5 with sulfuric acid or sodium hydroxide as necessary.

Use Instructions:
Squirt a small amount into sink and add hot water

Formulation No. 277

Liquid Dishwash Detergent-Intermediate

Ingredients:	% by Wt.
Water, D.I.	68.1
Bio-Soft LD-190	21.9
Sodium chloride	2.0
Urea	8.0

Mixing Procedure:
Blend ingredients in order given. Adjust pH with sulfuric acid to 6.5-7.5 before the addition of urea.

Properties:
Appearance: Clear straw-colored liquid
Viscosity @ 25C, cps: 150-200
Solids, %: 29-31
Freeze/thaw, 3 cycles: Pass
pH, as is: 6.5-7.5

Use Instructions:
Squirt small amount into sink and fill with hot water.

Performance:
Mini-plate Test:
Above formulation: 16 mini-plates washed
Palmolive control: 40 mini-plates washed

SOURCE: Stepan Co.: Formulation No. 296

Intermediate Liquid Dishwash

Ingredients:	% By Wt.
Alpha-Step ML-A	10.0
Bio Soft D-62	23.0
Ninol 40-CO	2.0
Sodium Chloride	1.5
Water	73.5

Procedure:

Charge water and blend in Alpha-Step ML-A and 40-CO. With good agitation, add Bio Soft D-62 and mix until homogeneous. Add sodium chloride and continue mixing until blended. Adjust pH to 6.5-7.5.

Dye and fragrance as desired.

Properties:

Appearance: Clear Yellow Liquid
pH, as is: 6.5-7.5
Solids, %: 22
Viscosity, cps: 200
Freeze/thaw Stability: Pass
50C Stability: Pass
Use Concentration: Squirt small amount into sink and fill with hot water

Formulation No. 217

Liquid Dishwash Detergent-Intermediate

Ingredients:	% by Wt.
Water, D.I.	63.8
NaOH (50%)	4.9
Stepanate SXS	1.9
Bio-Soft S-100	18.4
Steol CS-460	8.0
Ninol 40CO	3.0

Mixing Procedure:

Add ingredients in the order given above. Mix well between additions. Adjust pH to 6.5-7.5 with sulfuric or caustic if necessary.

Use Instructions:

Squirt small amount into sink and fill with hot water.

Properties:

Appearance: Clear yellow liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 225-275
Solids, %: 28-30
Freeze/thaw, 3 cycles: Pass

SOURCE: Stepan Co.: Formulation No. 473

Liquid Dishwash Detergent-Premium

Ingredients:	% By Wt.
Bio-Soft LD-150	98.8
Sodium Chloride	1.2

Mixing Procedure:
Blend ingredients in the order given. Adjust pH to 6.5-7.5 with sulfuric acid if necessary.

Properties:
Appearance: Clear yellow liquid
Viscosity @ 25C, cps: 175-225
pH, as is: 6.5-7.5
Solids, %: 50-51
Freeze/thaw, 3 cycles: Pass

Use Instructions:
Squirt a small amount into sink and fill with hot water.

Performance:
Mini-Plate Test:
Above formulation: 42 mini-plates washed
Palmolive control: 40 mini-plates washed

Formulation No. 23

Premium Liquid Dishwash

Ingredients:	% by Wt.
Alpha-Step ML-A	26.0
Bio Soft D-62	30.0
Water	44.0

Procedure:
Charge water and add Alpha-Step ML-A with good agitation. Blend in Bio Soft D-62. Mix until homogeneous. Adjust pH to 6.5 to 7.5 with sodium hydroxide to increase, or sulfuric acid to lower. Dye and fragrance as desired.

Properties:
Appearance: Clear Yellow Liquid
pH, as is: 6.5-7.5
Solids, %: 31
Viscosity, cps: 250 @ 25C
Freeze/thaw Stability: Pass
50C Stability: Pass
Use Concentration: Squirt small amount into sink and fill with hot water.

SOURCE: Stepan Co.: Formulation No. 216

Liquid Dishwash Detergent-Premium

Ingredients:	% By Wt.
Bio-Soft LD-150	93.0
Sodium sulfate	2.0
Stepanate SXS	3.0
Ammonyx LO	2.0

Mixing Procedure:
Add sodium sulfate to Bio-Soft LD-150 and mix well. Add Stepanate SXS with mixing and then add Ammonyx LO. Mix until clear and homogeneous. Adjust pH with sodium hydroxide or sulfuric acid if necessary.

Properties:
Appearance: Clear yellow liquid
pH, as is: 7.0-7.5
Viscosity @ 25C, cps: 200-260
Solids, %: 48-52

Use Instructions:
Squirt small amount into sink and fill with hot water.

Performance:
Mini-plate test:
Above formulation: 44 mini-plates washed
Palmolive control: 40 mini-plates washed

Formulation No. 276

Liquid Dishwash Detergent-Premium

Ingredients:	% By Wt.
Bio-Soft S-100	16.7
Steol CS-460	16.9
Ninol 96-SL	3.8
Stepanate SXS	9.8
Sodium chloride	2.5
NaOH (50%)	4.4
Water, D.I.	45.9

Mixing Procedure:
Add NaOH to water and mix. Add Stepanate SXS followed by Bio-Soft S-100. Mix well. Add Steol CS-460, and Ninol 96-SL while mixing. Lastly add salt and mix until clear and homogeneous.

Properties:
Appearance: Clear, light yellow liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 225-275
Solids, %: 34-36

Use Instructions:
Squirt small amount into sink and fill with hot water.

SOURCE: Stepan Co.: Formulation No. 332

Liquid Dishwash Detergent-Premium

Ingredients:	% by Wt.
Bio-Soft S-100	21.3
Sodium hydroxide (50%)	5.6
Alpha-Step ML-A	26.0
Stepanate SXS	1.0
Water, D.I.	46.1

Mixing Procedure:
Add Stepanate SXS and sodium hydroxide to water.
Add Bio-Soft S-100 while mixing to about a pH of 7.
Add Alpha-Step ML-A and mix until clear and uniform.

Properties:
Appearance: Clear yellow liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 200-250
Solids, %: 36-37
Freeze/thaw, 3 cycles: Pass

Use Instructions:
Squirt small amount into sink and fill with hot water.

Performance:
Mini-Plate Test:
Above formulation: 38 mini-plates washed
Palmolive control: 40 mini-plates washed
Formulation No. 466

Liquid Dishwash Detergent-Premium

Ingredients:	% by Wt.
Bio-Soft S-100	21.0
Sodium hydroxide (50%)	5.5
Alpha-Step ML-A	26.0
Stepanate SXS	1.0
Kessco EGMS	1.5
Water, D.I.	45.0

Mixing Procedure:
Add Stepanate SXS and sodium hydroxide to water. Add Bio-Soft S-100 while mixing to about a pH of 7. Add Alpha-Step ML-A and mix. Heat to 60C and add EGMS. Continue mixing until EGMS has dissolved and product comes back to ambient temperature.

Properties:
Appearance: Pearlized liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 300-400
Solids, %: 38-39
Freeze/thaw, 3 cycles: Pass

Use Instructions:
Squirt small amount into sink and fill with hot water.

Performance:
Mini-Plate Test:
Above formulation: 36 mini-plates washed
Palmolive control: 40 mini-plates washed

SOURCE: Stepan Co.: Formulation No. 467

Liquid Dishwash Detergent-Premium

Ingredients:	% By Wt.
Bio-Soft LD-150	80.0
Stepanate SXS	7.5
Kessco EGDS	1.0
Water, D.I.	11.5

Mixing Procedure:
Blend Stepanate SXS and water. Add LD-150 and heat to 60C. Add EGDS and mix until homogeneous. Continue mixing and cool to room temperature. Adjust pH to 6.5-7.5 with sulfuric acid if necessary.

Properties:
Appearance: Opaque, pearly, white liquid
pH, as is: 6.5-7.5
Solids, %: 41-43
Viscosity @ 25C, cps: 250-300
Freeze/thaw, 3 cycles: Pass

Use Instructions:
Squirt small amount into sink and fill with hot water.

Performance:
Mini-Plate Test:
Above formulation: 32 mini-plates washed
Palmolive control: 40 mini-plates washed
Formulation No. 273

Liquid Dishwash Detergent-Premium

Ingredients:	% by Wt.
Bio-Soft D-62	29.2
Steol CS-460	16.9
Ninol 96-SL	3.8
Stepanate SXS	8.0
Sodium Chloride	2.5
Water, D.I.	39.6

Mixing Procedure:
Add Stepanate SXS to water and mix. Add Bio-Soft D-62, Steol CS-460, and Ninol 96-SL while mixing. Lastly add salt and mix until clear and homogeneous. Adjust pH to 6.5-7.5 with sulfuric acid if necessary.

Properties:
Appearance: Clear, light yellow liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 225-275
Solids, %: 34-36

Use Instructions:
Squirt small amount into sink and fill with hot water.

SOURCE: Stepan Co.: Formulation No. 275

Premium Liquid Dishwash

Ingredients:	% by Wt.
Alpha-Step LD-200	70.0
Water	30.0

Procedure:
Charge water. With agitation, blend in the LD-200 and mix until homogeneous. Dye and fragrance as desired.

Properties:
Appearance at 25C: Clear Yellow Liquid
pH, as is: 6.5-7.5
Solids, %: 35
Viscosity at 25C, cps: 280
Freeze/thaw Stability: Pass
50C Stability: Pass
Use Level: Squirt small amount into sink and fill with hot water.

Formulation No. 243

Premium Liquid Dishwash

Ingredients:	% by Wt.
Alpha-Step ML-40	21.6
Bio Soft D-62	29.3
Steol CS-460	5.8
Ninol 40-CO	3.5
Water	49.8

Procedure:
Charge water. Add ML-40 and 40-CO and mix until homogeneous. With good agitation, slowly add CS-460 and D-62. Adjust pH to 6.5-7.5 with sodium hydroxide to increase or sulfuric acid to decrease. Dye and fragrance as desired.

Properties:
Appearance: Clear Yellow Liquid
pH, as is: 6.5-7.5
Solids, %: 31
Viscosity, as 25C, cps: 250
Freeze/thaw Stability: Pass
50C Stability: Pass
Use Concentration: Squirt small amount into sink and fill with hot water

SOURCE: Stepan Co.: Formulation No. 219

Dishwash Liquid Concentrate

	%w
Neodol 25-3A (60%)	22.5
Linear alkylbenzene sulfonate (97%)(a)	27.8
FADEA (b)	4.5
Preservative(s)	0.1
Water	to 100%

Properties:
Viscosity, 73F, cps: 700
Active matter, %w: 45

Blending Procedure:
Dissolve preservative and alkylbenzene sulfonate in water. Add Neodol 25-3A slowly to well stirred mixture, then add amide. Best results will be obtained if water is warm (e.g. 120F).

(a) Linear dodecylbenzene sulfonic acid such as Bio-Soft S-100, Stepan Co., or equivalent product, plus an equivalent amount of caustic (NaOH) can be used. pH should be between 5.5 and 7.5 before Neodol 25-3A is added (adjust with more alkylbenzene sulfonate or caustic).
(b) Fatty acid diethanol amide, such as Ninol 49CE, Stepan Co., or equivalent product.

Dishwash Liquid from Concentrate-Premium Quality

	%w
Concentrate	71.1
Ethanol SD-3A	4.0
Water, dye, perfume	24.9

Properties:
Viscosity, 73F, cps: 240
Clear point, F: 32

Dishwash Liquid from Concentrate-Good Quality

	%w
Concentrate	55.6
Ethanol SD-3A	2.0
Water, dye, perfume	42.4

Properties:
Viscosity, 73F, cps: 235
Clear point, F: 41

Blending Procedure:
Dissolve the ethanol or sodium sulfate in the water. Add the concentrate slowly with stirring. Adjust the pH to 6.5-7.0 using citric acid.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Dishwash Liquids From Concentrate (Continued)

Economy

	%w
Concentrate	44.4
Water, dye, perfume	55.6

Properties:
Viscosity, 73F, cps: 195
Clear point, F: 39

Generic

	%w
Concentrate	22.2
Sodium sulfate, anhydrous	3.0
Water, dye, perfume	74.8

Properties:
Viscosity, 73F, cps: 220
Clear point, F: 39

Blending Procedure:
Dissolve the ethanol or sodium sulfate in the water. Add the concentrate slowly with stirring. Adjust the pH to 6.5-7.0 using citric acid.

Dishwash Liquid Formulation-Premium Quality

	%w
Neodol 25-3S (60%)	18.3
C12LAS (60%) (a)	30.0
FADEA (b)	4.0
Sodium xylene sulfonate (40%)	8.5
Sodium chloride	3.0
Water, dye, perfume, preservatives	to 100%

Properties:
Viscosity, 73F, cps: 270
Clear point, F: 38
Adjust pH to 6.5-7.0 with citric acid.

(a) Witconate 1260, Witco Corp., Bio-Soft D-62, Stepan Co., or any equivalent product may be used.
(b) Fatty acid diethanol amide, such as Ninol 49CE, Stepan Co., or equivelent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products

Dishwash Liquid Formulations(Continued)

Good Quality

	%w
Neodol 25-3S (60%)	12.5
C12LAS (60%)(a)	25.0
FADEA(b)	2.5
Ethanol	3.0
Water, dye, perfume, preservatives	to 100%

Properties:
- Viscosity, 73F, cps: 134
- Clear point, F: 18
- Adjust pH to 6.5-7.0 with citric acid.

Economy

	%w
Neodol 25-3S (60%)	8.3
C12LAS (60%)(a)	13.5
FADEA(b)	1.9
Sodium xylene sulfonate (40%)	3.0
Sodium sulfate	0.6
Sodium chloride	1.0
Water, dye, perfume, preservatives	to 100%

Properties:
- Viscosity, 73F, cps: 104
- Clear point, F: 18
- Adjust pH to 6.5-7.0 with citric acid.

Generic

	%w
Neodol 25-3S (60%)	5.5
C12LAS (60%)(a)	9.2
FADEA(b)	1.2
Sodium xylene sulfonate (40%)	1.0
Sodium chloride	2.0
Water, dye, perfume, preservatives	to 100%

Properties:
- Viscosity, 73F, cps: 209
- Clear point, F: 18
- Adjust pH to 6.5-7.0 with citric acid

(a) Witconate 1260, Witco Corp., Bio-Soft D-62, Stepan Co., or any other equivalent product may be used.
(b) Fatty acid diethanol amide, such as Ninol 49CE, Stepan Co., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products

Hand Dishwash Liquid
High Quality

	%w
Neodol 91-8	4.8
Neodol 25-3S (60%)	8.0
C12LAS (60%) (a)	26.0
FADEA (b)	3.2
Ethanol	3.0
Water, dye, perfume, preservatives	to 100%

Properties:
Viscosity, 73F, cps: 67
Phase coalescence temp., F: >176
Clear point, F: 32
pH: 8.6

Good Quality

	%w
Neodol 91-8	3.0
Neodol 25-3S (60%)	5.0
C12 LAS (60%) (a)	16.7
FADEA (b)	2.0
Ammonium chloride	0.2
Water, dye, perfume, preservatives	to 100%

Properties:
Viscosity, 73F, cps: 18
Phase coalescence temp., F: >176
Clear point, F: 32
pH: 8.3

Economy

	%w
Neodol 91-8	1.5
Neodol 25-3S (60%)	2.5
C12 LAS (60%) (a)	8.3
FADEA (b)	1.0
Ammonium chloride	0.3
Water, dye, perfume, preservatives	to 100%

Properties:
Viscosity, 73F, cps: 6
Phase coalescence temp., F: >176
Clear point, F: 32 pH: 8.2

Blending Procedure:
Effective stirring should be maintained during addition of all ingredients, and each ingredient should be in solution before the next is added. Best results will be obtained if water is warm (e.g., 100-120F).

1. Dissolve the preservative,linear alkylbenzene sodium sulfonate (LAS), ethanol (when indicated) and ammonium chloride (when indicated) in water.
2. Add the Neodol 91-8. 3. Add the Neodol 25-3S slowly with efficient stirring. 4. Add the amide with efficient stirring.
5. Add perfume and dye as needed to give desired odor and color.

a) Witconate 1260 or a equivalent product. May use the appropriate amount of linear dodecylbenzene sulfonic acid with an equivalent amount of sodium hydroxide to neutralize it.
b) Fatty acid diethanolamide, such as Ninol 49 CE.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Industrial Dishwash, Mild Liquid

Ingredient:	Wt.%
Neodol 91-6 (1)	6.8
Neodol 91-2.5 (1)	2.3
DDBSA, 98% (2)	5.0
FADEA (3)	0.8
Sodium Hydroxide, 50%	1.3
Sodium Xylene Sulfonate, 40%	8.0
Sodium Tripolyphosphate (4)	1.8
Sodium Hexametaphosphate (5)	0.6
Water	to 100

(1) Shell Chemical Co.
(2) Stepan Biosoft S-100
(3) Stepan Chemical, Ninol 2012 EX
(4) Monsanto Code 101
(5) Monsanto Code 340

SOURCE: Monsanto Co.: Sodium Hexametaphosphate: Formula

Machine Dishwash, Liquid

Ingredient:	Wt.%
Water	55.76
Acrysol ASE-108 Stabilizer (1)	6.90
Potassium Hydroxide (45% sol.)	1.33
Tetrapotassium Pyrophosphate (2)	25.00
Trisodium Phosphate, Anhyd. (3)	5.00
NTA (4)	3.00
Surfactant (5)	3.00
Dye	0.01

(1) Rohm & Haas Co.
(2) Monsanto Co., Code 101
(3) Monsanto Co., Code 000
(4) Monsanto Co., Code 000
(5) Union Carbide Co., Triton CF-32

SOURCE: Monsanto Co.: NTA: Starter Formulary

Industrial Dishwash Formulations
Good Quality Pot and Pan Cleaner(a)

	%w
Neodol 91-6	8.6
Neodol 91-2.5	2.9
Neodol 25-3S (60%)	2.9
LAS (97%) (b)	5.9
FADEA (c)	3.5
Diethanolamine (d)	2.6
Sodium hexametaphosphate	2.0
Water, dye, perfume, preservatives	to 100%

Properties:
- Viscosity, 73F, cps: 122
- Clear point, F: 34
- pH: 9.1

High Quality Alkaline Pot and Pan Cleaner(a)

	%w
Neodol 1-5	11.5
Neodol 25-3S (60%)	2.9
LAS (97%) (b)	5.9
FADEA (c)	3.5
Monoethanolamine	2.5
Tetrapotassium pyrophosphate	2.0
Sodium silicate (46.9%) (e)	3.0
Sodium xylene sulfonate (40%)	5.0
Water, dye, perfume, preservatives	to 100%

Properties:
- Viscosity, 73F, cps: 58
- Clear point, F: 44
- Phase coalescence temp., F: >165
- pH: 12.1

(a) For lower foam function formulation, replace FADEA with Neodol 91-6.
(b) Linear alkylbenzene sulfonic acid. Such as Bio-Soft S-100, Stepan Co., or equivalent product.
(c) Fatty acid diethanolamide, Ninol 49CE, Stepan Co., or equivalent product.
(d) Can reduce pH by decreasing amount of diethanolamide.
(e) Mole ratio $Na_2O:SiO_2=1:2.4$, such as RU Silicate, PQ Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Industrial Dishwash Formulations
Regular Duty, Good Quality, Mild Liquid(a)

	%w
Neodol 91-6	6.8
Neodol 91-2.5	2.3
LAS (97%)(b)	5.0
FADEA (c)	0.8
Sodium hydroxide (50%)	1.3
Sodium xylene sulfonate (40%)	8.0
Sodium tripolyphosphate, anhydrous basis	1.8
Sodium hexametaphosphate	0.6
Water, dye, perfume, preservatives	to 100%

Properties:
- Viscosity, 73F, cps: 45
- Clear point, F: 37
- pH: 7.4

High Quality Pot and Pan Cleaner(a)

	%w
Neodol 91-6	10.5
Neodol 91-2.5	4.5
LAS (97%)(b)	8.8
FADEA (c)	3.3
Sodium hydroxide (50%)	2.2
Sodium hexametaphosphate	2.0
Sodium xylene sulfonate (40%)	5.0
Water, dye, perfume, preservatives	to 100%

Properties:
- Viscosity, 73F, cps: 83
- Clear point, F: 37
- pH: 8.6

(a) For lower foam formulation, replace FADEA with Neodol 91-6
(b) Linear alkylbenzene sulfonic acid. Such as Bio-Soft S-100, Stepan Co., or equivalent product.
(c) Fatty acid diethanolamide, Ninol 49 CE, Stepan Co., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

I&I Machine Dishwash: Dry Blend Formulation

Ingredient:	Wt.%
Sodium Tripolyphosphate (1)	45
Sodium Metasilicate, anhyd.	30
Nonionic Surfactant (2)	1
Sodium Hydroxide Beads	5
Sodium Carbonate	17
ACL 60 Chlorinating Comp. (3)	2

(1) Monsanto STP Code 185
(2) Such as Union Carbide Triton CF-101
(3) Monsanto Co.

I&I Machine Dishwash: Dry Blend Formulation

Ingredient:	Wt.%
Sodium Tripolyphosphate (1)	30-50
Sodium Metasilicate, anhyd.	15-30
Nonionic Surfactant (2)	0- 3
ACL 60 Chlorinating Comp. (3)	2- 6
Sodium Carbonate	11-53

(1) Monsanto STP Code 101
(2) Such as Union Carbide Triton CF-101
(3) Monsanto Co.

I&I Machine Dishwash: Slurry Automatic Dishwash

Ingredient:	Wt.%
Water	18.5
Sodium Carbonate	5
Sodium Silicate sol. (1)	21.3
Sodium Tripolyphosphate (2)	17.5
Sodium Hydroxide (50%)	20
Sodium Hypochlorite (5.25%)	13.7
Clay (3)	3
Polyacrylate (4)	1

(1) P.Q. Corp RU Silicate or equiv.
(2) Monsanto STP Code 067
(3) Engelhard Attagel 50 or equiv.
(4) Rohm & Haas Co. Acrysol LMW-45 or equiv.

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formulas

I&I Machine Dishwash: Dry Powder

Ingredient:	Wt.%
Sodium Tripolyphosphate (1)	35
Sodium Silicate anhydrous (2)	20
Sodium Hydroxide beads	20
Sodium Sulfate	19
Nonionic surfactant (3)	2
ACL 56 Chlorinating Comp. (4)	4

(1) Monsanto STP Code 101
(2) Such as PQ Corp. Britesil H24
(3) Such as BASF Corp. Plurafac RA-43
(4) Monsanto Co.

I&I Machine Dishwash: Dry Powder, No Surfactant

Ingredient:	Wt.%
Sodium Tripolyphosphate (1)	35
Sodium Metasilicate anhydrous	20
Sodium Hydroxide beads	20
Sodium Sulfate	21
ACL 56 Chlorinating Comp. (2)	4

(1) Monsanto STP Code 185
(2) Monsanto Co.

I&I Machine Dishwash: Flatware Presoak Block

Ingredient:	Wt.%
Water	16
Sodium Silicate sol. (1)	29
Low Foam Surfactant (2)	2
Sodium carbonate	23
Sodium tripolyphosphate (3)	30

(1) PQ Corp. RU Silicate or equiv.
(2) Texaco Surfonic LF-17 or equiv.
(3) Monsanto STP Code 285

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formulas

Liquid Dishwash Detergent

Ingredients:	% by Wt.
Water, D.I.	6.9
Alpha-Step ML-40	56.0
Steol CS-330	30.0
Ninol 40CO	5.6
Sodium chloride	1.5

Mixing Procedure:
Mix ingredients in the order given above. Adjust pH to 6.5-7.5 as necessary.

Properties:
Appearance: Clear yellow liquid
pH, as is: 7.0
Viscosity @ 25C, cps: 230
Solids, %: 40
Density, lbs/gal: 8.8
Freeze/thaw, 3 cycles: Pass
Cold Storage @ 4C, 2 weeks: Pass
Flash Point, F: >200

Performance:
Colgate Mini-Plate Test:
Above formulation: Washed 25 mini-plates
Palmolive control: Washed 40 mini-plates

Comment:
The surfactants used in this formulation are derived from naturally occurring resources, e.g., coconut or palm kernel oil. They are readily biodegradable. This formulation also contains salt for viscosity control.

SOURCE: Stepan Co.: Formulation No. 550

Dishwashing (Hand) Liquid

	%
Dodecylbenzenesulfonate, sodium salt	10-20
Poly-Tergent B-300 or SL-62	5-10
Ethanol	5-10
Coconut acid diethanolamine	3- 5
Dye-perfume	As desired
Water	Balance

SOURCE: Olin Chemicals: POLY-TERGENT Surfactants: Formula

Liquid Dishwash Detergent
Strong cleaning dishwash based on Barlox 12

Ingredients:	%wt/wt
LAS Slurry (approx. 50% active)	10.00
Carsonol SES-S	35.00
Barlox 12	12.50
Sodium Xylene Sulfonate	5.00
Alcohol SD-3A	7.00
Sodium Citrate	0.19
Citric Acid	0.10
Water, Fragrance, Dye and Dantogard	q.s. to 100

Approximately 30% Active

Preparative Procedure:

Charge the mixing vessel with all the water. Add the ingredients in the order listed, stirring after each addition until a clear solution is formed. Continue stirring for 10 minutes after the last ingredient has been added to insure uniformity of the batch. Add Dantogard as the last ingredient in sufficient quantity to insure adequate shelf life.

Liquid Dishwash Detergent
Mild dishwash based on Lonzaine CO

Ingredients:	% wt/wt
Lonzaine CO	16.0
Carsonol SES-A (60%)	22.6
Carsonol SES-S (60%)	30.0
Carsamide CA	1.8
Ammonium Chloride (34.8%)	4.0
Ethanol SDA-3	3.5
Glycosperse L-20	0.1
Citric Acid	0.17
Water	21.83
Dantogard	q.s.

30% Active

Preparative Procedure:

Charge the mixing vessel with all the water. Add the ingredients in the order listed, stirring after each addition until a clear solution is formed. Continue stirring for 10 minutes after the last ingredient has been added to insure uniformity of the batch. Adjust final pH to a range of 7 to 8. Add Dantogard in sufficient quantity to insure adequate shelf life.

SOURCE: Lonza Inc.: Household, Industrial & Instititutional Cleaners: Formulas

Liquid Dishwashing Detergent
Low cost household product

Ingredients:	% wt/wt
Carsonol SES-S (60%)	14.50
Sodium linear alkyl sulfonate (60%)	28.50
Unamide LDL	4.50
Citric acid (50%)	0.15
Water	52.35
Dantogard	q.s.

pH: approx. 7
Viscosity: 300 cps
Actives: 30%

Preparative Procedure:

Charge the mixing vessel with all the water. Add the ingredients in the order listed, stirring after each addition until a clear solution is formed. Continue stirring for 10 minutes after the last ingredient has been added to insure uniformity of the batch. Add Dantogard in sufficient quantity to insure adequate shelf life.

SOURCE: Lonza Inc.: Household, Industrial & Institutional Cleaners: Formula

Liquid Dishwasher Detergent

	% by Wt.
Water-Deionized	42.4
(1) Korthix H	3.0
(2) High Mono Stearyl Acid Phosphate	0.6
(3) Caustic Soda-50% (Rayon Grade)	2.0
(4) Light Density Soda Ash	10.0
(5) Sodium Tripoly Phosphate Light Density Grade 067	20.0
(6) Metso 204B Sodium-Meta Silicate Anhydrous	11.0
(7) Detergent (chlorine resistant) (low foam)	1.0
(8) Sodium Hypochlorite (12.5% active)	10.0

Sources:
(4) Fine particle size type
(7) Avanel S-74 or Dow Fax 2A

Procedure:
(A) Mix Korthix H and water under high shear (e.g. Cowles type mixer) for 15-20 minutes slowly.
(B) Reduce speed of agitation and slowly add (2) and (3). Mixture will become very viscous.
(C) Slowly add (4), (5), and (6) blending well after each addition. Temperature will increase to 125-140F.
(D) Apply external cooling to reduce temperature to 90F or less.
(E) Add (7) detergent and (8) Hypochlorite, blending well after each addition.
(F) Colorant and Fragrance can also be added as desired.

SOURCE: Kaopolite, Inc.: Suggested Starting Formulation

Liquid Machine Dishwashing Detergent

Ingredients:	%wt/wt
Amphoterge KJ-2	2.0
Sodium carbonate	9.0
Tetrapotassium pyrophosphate	12.0
Kasil No. 1	22.0
Potassium hydroxide (45% sol'n.)	8.0
Water	47.0

Preparative Procedure:

Charge the mixing vessel with all the water. Slowly add potassium hydroxide followed by the sodium carbonate, tetrapotassium pyrophosphate and Kasil No. 1. Mix until fully dissolved then add Amphoterge KJ-2. Mix for 10-15 minutes to insure batch uniformity.

Formula Y-54-1

Machine Dishwashing Detergent

Ingredients:	%wt/wt
Alkawet CF	2.0
Sodium carbonate	18.0
Sodium metasilicate, anhydrous	30.0
Sodium tripolyphosphate	50.0

Preparative Procedure:

Blend the sodium metasilicate and sodium tripolyphosphate in the mixing vessel. In a separate vessel, mix the Alkawet CF and sodium carbonate until a uniform system is obtained. Add the sodium carbonate/Alkawet CF mixture to the batch and blend the system until uniform.

SOURCE: Lonza, Inc.: Household, Industrial & Institutional Cleaners: Formula C-99-91

Premium Light Duty (Dishwashing) Liquid

Component:	Wt.%
C-550 LAS	40
Alfonic 1412-S Ether Sulfate	8.3
LDEA	4
SXS	10
Dye, fragrance, water	q.s.

q.s.=quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 240
Cloud/clear (F): 23/28
pH: 9.5
Order of Addition:
LDEA, SXS, LAS, Water to 100%

Moderate Light Duty (Dishwashing) Liquid

Component:	Wt.%
C-550 LAS	32
Alfonic 1412-S Ether Sulfate	6.7
LDEA	3
SXS	6
Dye, fragrance, water	q.s.

q.s.=quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 175
Cloud/clear (F): 20/31
pH: 9.5
Order of Addition:
LDEA, SXS, LAS, Water to 100%

Economy Light Duty (Dishwashing) Liquid

Component:	Wt.%
C-550 LAS	24
Alfonic 1412-S Ether Sulfate	5
LDEA	2
SXS	4
Na Sulfate	5
Dye, fragrance, water	q.s.

q.s.=quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 250
Cloud/clear (F): 35/41
pH: 9.0
Order of Addition:
LDEA, SXS, Sodium Sulfate, LAS, Water to 100%

SOURCE: Vista Chemical Co.: Example Starting Formulations

5. Detergents/Disinfectants

Aerosol Surface Disinfectant

Ingredients:	% by Wt.
Water	10.00
BTC 2125M (50% Active) EPA Reg. No. 1839-46	0.40
Triethylene glycol	6.00
Isopropyl alcohol	53.00
Morpholine	0.10
Fragrances:	0.05
PFWDJY SYN 802274 (Polak Frutal Works)	
Isobutane propellant (Air Products & Chemicals)	30.00

Mixing Procedure:
For liquid phase, charge vessel with water and add ingredients as shown above. Follow manufacturing procedures for aerosol products.

Properties for Liquid Phase Only:
Appearance: Clear, colorless liquid
pH, as is: 11.7
Density, lbs/gal: 7.03
Viscosity, @ 25C: Water thin

Use Instructions:
Surface disinfection and deodorization:
Spray surface until completely wet. Allow the surface to remain wet for 10 minutes. Let air dry.
Mildewstat:
Spray surface to be treated, making sure surface is completely wet. Let air dry. Repeat at weekly intervals or when mildew growth reappears.
WARNING: This formulation may be corrosive to some metals. Test corrosivity with container manufacturer prior to packaging.
For complete use instructions, see EPA registered label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Dept. for subregistration package.
EPA Registration No. 1839-85

SOURCE: Stepan Co.: Formulation No. 37

CD 1.6 Detergent/Disinfectant

Ingredients:	% by Wt.
Water	81.9
BTC 2125M (50% Active) EPA Reg. No. 1839-46	3.2
Sodium metasilicate anhydrous	2.4
EDTA (38%)	2.5
Neutronyx 656	5.0
Tetrapotassium pyrophosphate anhydrous	5.0

Mixing Procedure:

Charge vessel with water and dissolve powdered builders while mixing. Add remaining liquid ingredients in order shown.

Properties:

Appearance: Clear, colorless liquid
pH, as is: 13.1
Density, lbs/gal: 8.85
Viscosity @ 25C: Water thin

Use Instructions:

General Disinfection: 4.5 ozs. per gallon of water
Hospital Disinfection: 6.0 ozs. per gallon of water
Mildewstat: 4.5 ozs. per gallon of water
Sanitization: 8.0 ozs. per gallon of water
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-50

SOURCE: Stepan Co.: Formulation No. 33

CD 1.6 (D&F) Deterg/Disinfect

Ingredients:	% by Wt.
Water	81.705
BTC 2125M (50% Active) EPA Reg. No. 1839-46	3.200
EDTA (38%)	2.500
Neutronyx 656	5.000
Sodium metasilicate anhydrous	2.400
Tetrapotassium pyrophosphate anhydrous	5.000
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Anthraquinone Blue 3G (Pylam Products)	
Pyla-Cert Grass Green MX-3 (Pylam Products)	
Fragrances:	0.190
Lemon Oil PCC10-190 (Givaudan, Inc.)	
Felton Fragrance D-2861 (Felton Int.)	
Felton Fragrance D-2860 (Felton Int.)	
P 643 Wintergreen Mint (Northville Labs, Inc.)	
Pine Fragrance #14064 (Bush, Boake, Allen)	
Floral #14066 (Bush, Boake, Allen)	

Mixing Procedure:

Charge vessel with water and add sodium metasilicate while mixing to obtain a homogeneous solution. Add TKPP and continue to mix until homogeneous. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 13.1
Density, lbs/gal: 8.60

Use Instructions

General Disinfection: 4.5 ozs. per gallon of water
Hospital Disinfection: 6.0 ozs. per gallon of water
Mildewstat: 4.5 ozs. per gallon of water
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-101

SOURCE: Stepan Co.: Formulation No. 83

CD 3.2 Detergent/Disinfectant

Ingredients:	% By Wt.
Water	84.1
BTC 2125M (50% Active) EPA Reg. No. 1839-46	6.4
EDTA (38%)	4.5
Sodium carbonate	3.0
Sodium tripolyphosphate, anhydrous	2.0

Mixing Procedure:

Charge vessel with water and add sodium carbonate while mixing until homogeneous solution is obtained. Add STPP and continue to mix until homogeneous.

Properties:

Appearance: Clear liquid
pH, as is: 11.1
Density, lbs/gal: 8.72
Viscosity @ 25C: Water thin

Use Directions:

General Disinfection: 2.0 ozs. per gallon of water
Hospital Disinfection: 3.0 ozs. per gallon of water
Mildewstat: 2.0 ozs. per gallon of water
Sanitization: 4.0 ozs. per gallon of water
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-49

SOURCE: Stepan Co.: Formulation No. 71

CD 3.2 (D&F) Deterg/Disinfect

Ingredients:	% By Wt.
Water	83.905
BTC 2125M (50% Active) EPA Reg. No. 1839-46	6.400
Sodium carbonate	3.000
Sodium tripolyphosphate anhydrous	2.000
Neutronyx 656	4.500
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Anthraquinone Blue 3G (Pylam Products)	
Pyla-Cert Grass Green MX-3 (Pylam Products)	
Fragrances:	0.190
Lemon Oil PCC10-190 (Givaudan)	
Felton Fragrance D-2861 (Felton Int.)	
Felton Fragrance D-2860 (Felton Int.)	
P-643 Wintergreen Mint (Northville Labs, Inc.)	
Floral #14066 (Bush, Boake, Allen)	
Pine Fragrance #14064 (Bush, Boake, Allen)	

Mixing Procedures:

Charge vessel with water and add carbonate while mixing until homogeneous. Add STPP and continue to mix until homogeneous. Add remaining ingredients in order shown while mixing until homogeneous.

Properties:

Appearance: Clear liquid
pH, as is: 11.1
Density, lbs/gal: 8.72
Viscosity @ 25C: Water thin

Use Instructions:

General Disinfection: 2 ozs. per gallon of water.
Hospital Disinfection: 3 ozs. per gallon of water
Mildewstat: 2 ozs. per gallon of water
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-103

SOURCE: Stepan Co.: Formulation No. 92

CD 4.5 Detergent/Disinfectant

Ingredients:	% by Wt.
Water	81.5
BTC 2125M (50% Active) EPA Reg. No. 1839-46	9.0
Neutronyx 656	4.5
Sodium carbonate	3.0
Sodium tripolyphosphate, anhydrous	2.0

Mixing Procedure:

Charge vessel with water and add sodium carbonate while mixing to obtain a homogeneous solution. Add STPP and continue to mix until homogeneous. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 10.9
Density, lbs/gal: 8.73
Viscosity @ 25C: Water thin

Use Directions:

Hospital and General Disinfection: Dilute 2 oz. per gallon of water
Mildewstat: Dilute 2 ozs. per gallon of water
Sanitization: Dilute 2 ozs. per 3.5 gallons of water
For complete use instructions, see EPA Registered Label

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-47

SOURCE: Stepan Co.: Formulation No. 79

CD 4.5 (D&F) Detergent/Disinfectant

Ingredients:	% by Wt
Water	81.305
BTC 2125M (50% Active) EPA Reg. No. 1839-46	9.000
Neutronyx 656	4.500
Sodium Carbonate	3.000
Sodium Tripolyphosphate Anhydrous	2.000
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Anthraquinone Blue 3G (Pylam Products)	
Pyla-Cert Grass Green MX-3 (Pylam Products)	
Fragrances:	0.190
Lemon Oil PCC10-190 (Givaudan)	
Felton Fragrance D-2861 (Felton Int.)	
Felton Fragrance D-2860 (Felton Int.)	
P-643 Wintergreen Mint (Northville Lab, Inc.)	
Floral #14066 (Bush, Boake, Allen)	
Pine Fragrance 14064 (Bush, Boake, Allen)	

Mixing Procedures:

Charge vessel with water and dissolve sodium carbonate and sodium tripolyphosphate while mixing until homogeneous. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

pH, as is: 11.0
Density, lbs/gal: 8.66
Viscosity @ 25C: Water thin

Use Instructions:

Hospital and General Disinfection: 2 ozs. per gallon
Mildewstat: 2.0 ozs. per gallon
For complete use instructions, see EPA Registered Label

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-102

SOURCE: Stepan Co.: Formulation No. 96

NP 1.8 (D&F) Detergent/Disinfectant

Ingredients:	%by Wt.
Water	87.705
BTC 885 (50% active) EPA Reg. No. 1839-113	3.600
Sodium metasilicate pentahydrate	1.000
EDTA (38%)	5.000
Nonyl phenol polyoxyethylene (9-13 mole EO)	2.500
Dyes:	0.005
Pylaklor Acid Red LX-6515 (Pylam)	
FD&C Yellow #5	
FD&C Red #40	
Pyla-Cert Grass Green MX-3 (Pylam)	
Anthraquinone Blue 3G (Pylam)	
Fragrances:	0.190
Floral #14066 (Bush, Boake & Allen)	
Felcosan 745 (Felton Int.)	
Felton BQT BD 160 (Felton Int.)	
Pine Fragrance #14064 (Bush, Boake & Allen)	
P643 Wintergreen Mint (Nothville Labs)	

Mixing Procedure:

Charge vessel with water and dissolve metasilicate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 12.5
Density, lbs/gal: 8.50
Viscosity @ 25C: Water thin

Use Instructions:

General Disinfection: 2.0 ozs. per gallon
Sanitization (non-food contact surfaces): 5.0 ozs. per 4.5 gals.
Mildewstat: 2.0 ozs. per gallon
Virucidal: 2.0 ozs. per gallon
Fungicidal: 2.0 ozs. per gallon
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-146

SOURCE: Stepan Co.: Formulation No. 501

NP 3.2 Detergent/Disinfectant

Ingredients:		% by Wt.
Water		83.6
BTC 2125M (50% Active)	EPA Reg. No. 1839-46	6.4
Neutronyx 656		4.5
EDTA (38%)		2.5
Sodium Carbonate		3.0

Mixing Procedure:
Charge vessel with water and dissolve sodium carbonate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:
pH, as is: 11.6
Density, lbs/gal: 8.60
Viscosity @ 25C: Water thin

Use Instructions:
General Disinfectant: 2.0 ozs. per gallon
Hospital Disinfection: 3.0 ozs. per gallon
Mildewstat: 2.0 ozs. per gallon
Sanitization: 4 ozs. per gallon
For complete use instructions, see EPA Registered Label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA.
Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-78

SOURCE: Stepan Co.: Formulation No. 115

NP 3.2 (D&F) Detergent/Disinfectant

Ingredients:	% by Wt.
Water	83.405
BTC 2125M (50% Active) EPA Reg. No. 1839-46	6.400
EDTA (38%)	2.500
Neutronyx 656	4.500
Sodium Carbonate	3.000
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Hastings Sky Blue OB (Crompton & Knowles)	
Pyla-Cert Grass Green MX-3 (Pylam Products)	
Solvent Red #49 (CI 45170)	
Acid Yellow #34 (CI 18890)	
Fragrances:	0.190
Lemon Oil PCC10-190 (Givaudan)	
Felton Fragrance D-2861 (Felton Int.)	
Felton Fragrance D-2860 (Felton Int.)	
Floral #14064 (Bush, Boake, Allen)	
Pine Fragrance #14066 (Bush, Boake, Allen)	
Alpine #30291 (Alpine Aromatics)	
Herco Pine Oil (Hercules, Inc.)	
Super Lemon #1026 (Global Aromatics)	

Mixing Procedure:

Charge vessel with water and dissolve sodium carbonate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

pH, as is: 11.7
Density, lbs/gal: 8.63
Viscosity @ 25C: Water thin

Use Instructions:

General Disinfection: 2.0 ozs. per gallon
Hospital Disinfection: 3.0 ozs. per gallon
Mildewstat: 2.0 ozs. per gallon
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-94

SOURCE: Stepan Co.: Formulation No. 116

NP 4.5 Detergent/Disinfectant

Ingredients:	% By Wt.
Water	81.0
BTC 2125M (50% Active) EPA Reg. No. 1839-46	9.0
EDTA (38%)	2.5
Neutronyx 656	4.5
Sodium Carbonate	3.0

Mixing Procedure:
Charge vessel with water and dissolve carbonate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:
pH, as is: 11.7
Density, lbs/gal: 8.66
Viscosity @ 25C: Water thin

Use Instructions:
Hospital & General Disinfection: 2.0 ozs. per gallon
Mildewstat: 2.0 ozs. per gallon
For complete use instructions, see EPA Registered Label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-79

SOURCE: Stepan Co.: Formulation No. 127

NP 4.5 (D&F) Detergent/Disinfectant

Ingredients:	% By Wt.
Water	80.805
BTC 2125M (50% Active) EPA Reg. No. 1839-46	9.000
EDTA (38%)	2.500
Neutronyx 100	4.500
Sodium Carbonate	3.000
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Anthraquinone Blue 3G (Pylam Products)	
Pyla-Cert Grass Green MX-3 (Pylam Products)	
Fragrances:	0.190
Lemon Oil PCC10-190 (Givaudan)	
Felton Fragrance D-2861 (Felton Int.)	
Felton Fragrance D-2860 (Felton Int.)	
Fragrascent Floral #468860 (Newman, Buslee, Wolfe)	
Fragrascent #14066 (Bush, Boake, Allen)	
Pine Fragrance #14064 (Bush, Boake, Allen)	

Mixing Procedures:
Charge vessel with water and dissolve sodium carbonate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:
pH, as is: 11.7
Density, lbs/gal: 8.62
Viscosity @ 25C: Water thin

Use Instructions:
Hospital & General Disinfection: 2.0 ozs. per gallon.
Mildewstat: 2.0 ozs. per gallon.
For complete use instructions, see EPA Registered Label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-95

SOURCE: Stepan Co.: Formulation No. 128

NP 5.5 HW Detergent/Disinfectant

Ingredients:	% by Wt.
Water	81.0
BTC 885 (50% Active) EPA Reg. No. 1839-113	11.0
Sodium metasilicate - 5H2O	0.5
EDTA (38%)	5.0
Nonionic surfactant*	2.5
Neutronyx 656 or	
Makon 10 or	
Tergitol NP-9 or	
Tergitol 25-L-9 or	
Tergitol 15-S-9 or	
Neodol 25-9 or	
Surfonic N-95	

Mixing Procedure:

Charge vessel with water and dissolve metasilicate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 12.4
Density (lbs/gal): 8.42
Viscosity @ 25C: Water thin

Use Instructions:

Hospital Disinfection: 2.0 ozs. per gallon
General Disinfection: 1.25 ozs. per gallon
Sanitization (food contact surfaces): 1.0 oz. per 2.75 gallons
Sanitization (non-food contact surfaces): 1.0 oz. per 2.75 gallons
Mildewstat: 1.25 ozs. per gallon
Fungicidal: 1.25 ozs. per gallon
Virucidal: 1.25 ozs. per gallon

Efficacy tests have demonstrated that NP 5.5 HW is an effective bactericide, fungicide, and virucide in hard water up to 400 ppm hardness (as $CaCO_3$) in the presence of organic soil (5% blood serum).

For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.

EPA Registration Number 1839-149

SOURCE: Stepan Co.: Formulation No. 502

NP 5.5 HW (D&F) Detergent/Disinfectant

Ingredients:	% by Wt.
Water	80.805
BTC 885 (50% active) EPA Reg. No. 1839-113	11.000
Sodium metasilicate-5H2O	0.500
EDTA (38%)	2.500
Nonionic surfactant*	2.500
*Neutronyx 656 or	
Makon 10 or	
Tergitol NP-9 or	
Tergitol 25-L-9 or	
Tergitol 15-S-9 or	
Neodol 25-9 or	
Surfonic N-95	
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Pyla-cert Grass Green MX-3 (Pylam)	
Anthraquinone Blue 3G (Pylam)	
Turquoise Blue G (AD Dye Stuff)	
Fragrances:	0.190
Floral Bouquet Q132-82 (Continental Aromatics)	
Floral #14066 (Bush, Boake & Allen)	
Lemon Oil PCC 10-190 (Givaudan Corp.)	
Felcosan 754 (Felton Worldwide)	
Felton BQT BD 160 (Felton Worldwide)	
Pine Fragrance #14064 (Bush, Boake & Allen)	
P643 Wintergreen Mint (Northville Labs)	

Mixing Procedure:

Charge vessel with water and dissolve metasilicate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 12.4
Density, lbs/gal: 8.42
Viscosity @ 25C: Water thin

Use Instructions:

Hospital Disinfection: 2.0 ozs. per gallon
General Disinfection: 1.25 ozs. per gallon
Sanitization (non-food contact surfaces): 1.0 oz. per 2.75 gal
Virucidal: 2.0 ozs. per gallon
Mildewstat: 2.0 ozs. per gallon
Fungicidal: 2.0 ozs. per gallon

Efficacy tests have demonstrated that NP 5.5 HW (D&F) is an effective bactericide, fungicide, and virucide in hard water up to 400 ppm hardness (as CaCO3) in the presence of organic soil (5% blood serum).

For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its orginal state upon thawing. Stable at 120F for 30 days.

Comments: EPA Registration Number 1839-144

SOURCE: Stepan Co.: Formulation No. 503

NP 7.0 Detergent/Disinfectant

Ingredients:		% by Wt.
Water		73.0
BTC 885 (50% active)	EPA Reg. No. 1839-113	14.0
Sodium metasilicate-5H2O		1.0
EDTA (38%)		8.0
Nonionic surfactant*		4.0

*Neutronyx 656
Makon 10
Tergitol NP-9
Tergitol 25-L-9
Tergitol 15-S-9
Neodol 25-9
Surfonic N-95

Mixing Procedure:
Charge vessel with water and dissolve metasilicate. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:
Appearance: Clear liquid
pH, as is: 12.5
Density (lbs/gal): 8.50
Viscosity @ 25C: Water thin

Use Instructions:
Hospital Disinfection: 1.0 oz. per gallon
General Disinfection: 1.0 oz. per gallon
Sanitization (food contact surfaces): 1.0 oz. per 3.5 gallons
Sanitization (non-food contact surfaces): 1.0 oz. per 3.5 gallons
Mildewstat: 1.0 oz. per gallon
Fungicidal: 1.0 oz. per gallon
Virucidal: 1.0 oz. per gallon
For complete use instructions, see EPA Registered Label.
EPA Registration Number 1839-145

SOURCE: Stepan Co.: Formulation No. 504

NP 7.0 (D&F) Detergent/Disinfectant

Ingredients:	% By Wt.
Water	72.805
Sodium metasilicate - 5 H2O	1.000
BTC 885 (50% active) EPA Reg. No. 1839-113	14.000
EDTA (38%)	8.000
Nonyl phenol polyoxyethylene (9-13 mole EO)	4.000
Dyes:	0.005
Pylaklor Yellow S-184 (Pylam)	
Pyla-Cert Grass Green MX-3 (Pylam)	
Anthraquinone Blue 3G (Pylam)	
FD&C Yellow #5	
FD&C Red #40	
Fragrances:	0.190
Felcosan 754 (Felton Int.)	
Felton BQT BD 160 (Felton Int.)	
Pine Fragrance #14064 (Bush, Boake & Allen)	
P643 Wintergreen Mint (Northville Labs)	
Green Palm #139386 (Alpine Aromatics)	
Purity Clean #139386 (Alpine Aromatics)	
Fresh Lemon #160529 (Alpine Aromatics)	

Mixing Procedure:

Charge vessel with water and dissolve metasilicate. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 12.5
Density, lbs/gal: 8.50
Viscosity @ 25C: Water thin

Use Instructions:

Hospital Disinfection: 1.0 oz. per gallon
General Disinfection: 1.0 oz. per gallon
Sanitization (non-food contact surfaces): 1.0 per 3.5 gallons
Mildewstat: 1.0 oz. per gallon
Virucidal: 1.0 oz. per gallon
Fungicidal: 1.0 oz. per gallon
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 dazys.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-145

SOURCE: Stepan Co.: Formulation No. 505

NP 9.0 Detergent/Disinfectant

Ingredients:	% By Wt.
Water	64.0
BTC 2125M (50% Active) EPA Reg. No. 1839-46	18.0
EDTA (38%)	5.0
Neutronyx 656	9.0
Sodium Carbonate	4.0

Mixing Procedure:

Charge vessel with water and dissolve sodium carbonate while mixing. Add remaining ingredients in order shown while mixing to obtain homogeneous solution.

Properties:

pH, as is: 12.0
Density, lbs/gal: 8.75
Viscosity @ 25C: Water thin

Use Instructions:

Hospital & General Disinfection: 1.0 ozs. per gallon
Mildewstat: 1.0 ozs. per gallon
Sanitization: 1.0 ozs. per 3.5 gallons
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-81

SOURCE: Stepan Co.: Formulation No. 126

NP 9.0 (D&F) Deterg/Disinfect

Ingredients:	% by Wt.
Water	63.805
BTC 2125M (50% Active) EPA Reg. No. 1839-46	18.000
EDTA (38%)	5.000
Neutronyx 100	9.000
Sodium carbonate	4.000
Dyes:	0.005
FD&C yellow #5	
FD&C red #40	
Ulcacid Naphthol yellow-s (International Dyes)	
Pyla-cert grass green MX-3 (Pylam Products)	
Hastings sky blue OB (Crompton & Knowles)	
Fragrances:	0.190
Lemon oil PCC10-190 (Givaudan)	
Felton Fragrance D-2861 (Felton Int.)	
Felton Fragrance D-2860 (Felton Int.)	
Floral #14066 (Bush, Boake, Allen)	
Pine Fragrance #14064 (Bush, Boake, Allen)	

Mixing Procedures:

Charge vessel with water and add sodium carbonate. Mix until carbonate is completely dissolved. Add remaining ingredients in order shown while mixing until homogeneous solution is obtained.

Properties:

Appearance: Clear liquid
pH, as is: 12.0
Density, lbs/gal: 8.8
Viscosity @ 25C: Water thin

Use Instructions:

For Hospital and Instititutional disinfection dilute at 1 oz. per gallon of water.

For use as a mildewstat, dilute at 1 oz. per gallon of water.

For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.

EPA Registration Number 1839-96

SOURCE: Stepan Co.: Formulation No. 129

NP 11.0 HW (D&F) Detergent/Disinfectant

Ingredients:	% By Wt.
Water	65.605
BTC 885 (50% active) EPA Reg. No. 1839-113	21.700
Sodium metasilicate - 5H2O	1.000
EDTA (38%)	7.000
Nonionic surfactant*	4.500
*Neutronyx 656 or	
Makon 10 or	
Tergitol NP-9 or	
Tergitol 25-L-9 or	
Tergitol 15-S-9 or	
Neodol 25-9 or	
Surfonic N-95	
Dyes:	0.005
Acid Yellow #23	
Acid Green #25	
FD&C Yellow #5	
FD&C Red #40	
Pyla-Cert Grass Green MX-3 (Pylam)	
Anthraquinone Blue 3G (Pylam)	
Fragrances:	0.190
Floral #14066 (Bush, Boake & Allen)	
Pine Fragrance #14064 (Bush, Boake & Allen)	
Felcosan 754 (Felton Int.)	
Felton BQT BD 160 (Felton Int.)	
Lemon Oil PCC 10-190 (Givaudan Corp.)	
P643 Wintergreen Mint (Northville Labs)	
Green Palm #139386 (Alpine Aromatics)	
Fragrance Z-4479 (Florasynth Inc.)	

Mixing Procedure:
Charge vessel with water and dissolve metasilicate. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:
- Appearance: Clear liquid
- pH, as is: 12.5
- Density, lbs/gal: 8.44
- Viscosity @ 25C: Water thin

Use Instructions:
- Hospital Disinfection: 1.0 oz. per gallon
- General Disinfection: 1.0 oz. per gallon
- Sanitization (non-food contact surfaces): 1.0 oz. per 5.5 gallons
- Mildewstat: 1.0 oz. per gallon
- Virucidal: 1.0 oz. per gallon
- Fungicidal: 1.0 oz. per gallon

Storage Stability: Freeze/thaw stable. Stable at 120F for 30 days.

Comments:
EPA Registration Number 1839-143

SOURCE: Stepan Co.: Formulation No. 506

NP 12.5 Detergent/Disinfectant

Ingredients:		% by Wt.
Water		56.0
BTC 2125M (50% Active)	EPA Reg. No. 1839-46	25.0
EDTA (38%)		9.0
Neutronyx 656		7.0
Sodium Sesquicarbonate		3.0

Mixing Procedure:

Charge vessel with water and dissolve sodium sesquicarbonate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 10.0
Density, lbs/gal: 8.7
Viscosity @ 25C: Water thin

Use Instructions:

Hospital & General Disinfection: 0.5 oz. per gallon.
Mildewstat: 0.5 oz per gallon.
Sanitization: 1 oz per gallon.

For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-80

SOURCE: Stepan Co.: Formulation No. 132

NP 12.5 (D&F) Detergent/Disinfectant

Ingredients:	% By Wt.
Water	55.805
BTC 2125M (50% Active) EPA Reg. No. 1839-46	25.000
EDTA (38%)	9.000
Neutronyx 656	7.000
Sodium Sesquicarbonate	3.000
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Anthraquinone Blue 3G (Pylam Products)	
Pyla-Cert Grass Green MX-3 (Pylam Products)	
Fragrances:	0.190
Lemon Oil PCC10-190 (Givaudan)	
Felton Fragrance D-2861 (Felton Int.)	
Felton Fragrance D-2860 (Felton Int.)	
Floral #14066 (Bush, Boake, Allen)	
Pine Fragrance #14064 (Bush, Boake, Allen)	
Rainfresh #135387 (Alpine Aromatics)	
Neutralfresh #139387 (Alpine Aromatics)	
Green Palm #139386 (Alpine Aromatics)	

Mixing Procedure:

Charge vesssel with water and dissolve sodium sesquicarbonate while mixing. Add remaining ingredients in order shown while mixing to obtain homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 10.0
Density, lbs/gal: 8.69
Viscosity @ 25C: Water thin

Use Instructions:

Hospital & General Disinfection: 0.5 oz. per gallon.
Mildewstat: 0.5 oz. per gallon.
For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-97

SOURCE: Stepan Co.: Formulation No. 133

NP 22.0 HW (D&F) Detergent/Disinfectant

Ingredients:	% By Wt.
Water	40.905
BTC 885 (50% active) EPA Reg. No. 1839-113	43.400
Sodium metasilicate-5H2O	1.500
EDTA (38%)	8.000
Nonyl phenol polyoxyethylene (9-13 mole EO)	5.000
Dyes:	0.005
FD&C Yellow #5	
FD&C Red #40	
Pyla-Cert Grass Green MX-3 (Pylam)	
Anthraquinone Blue 3G (Pylam)	
Fragrances:	0.190
Floral #14066 (Bush, Boake & Allen)	
Pine Fragrance #14064 (Bush, Boake & Allen)	
Felcosan 754 (Felton Int.)	
Felton BQT BD 160 (Felton Int.)	
P643 Wintergreen Mint (Northville Labs)	
Green Palm #139386 (Alpine Aromatics)	
Lemon #160527 (Alpine Aromatics)	
Soap #160528 (Alpine Aromatics)	

Mixing Procedure:

Charge vessel with water and dissolve metasilicate.

Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
Viscosity @ 25C: Water thin
pH, as is: 12.4
Density, lbs/gal: 8.38

Use Instructions:

Hospital Disinfection: 0.5 oz. per gallon
General Disinfection: 0.5 oz. per gallon
Sanitization (non-food contact surfaces): 0.5 oz. per 5.5 gallons
Virucidal: 0.5 oz. per gallon
Mildewstat: 0.5 oz. per gallon
Fungicidal: 0.5 oz. per gallon

Effficacy tests have demonstrated that NP 22.0 HW (D&F) is an effective bactericide, fungicide, and virucide in hard water up to 400 ppm hardness (as CaCO3) in the presence of organic soil (5% blood serum).

For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.

EPA Registration Number 1839-147

SOURCE: Stepan Co.: Formulation No. 507

Detergent/Disinfectant Pump Spray

Ingredients:	%w
Water	90.170
BTC 2125M (50% Active) EPA Reg. No. 1839-46	0.421
EDTA (38%)	4.210
Neutronyx 656	0.526
Sodium metasilicate pentahydrate	0.263
Ethylene glycol monobutyl ether	2.105
Diethylene glycol monoethyl ether	2.105
Fragrances:	0.200
Pine needles SYN802277U (Polak Frutal Works)	
3971-T IFF (International Flavors & Fragrances)	

Mixing Procedure:

Charge vessel with water and dissolve metasilicate while mixing. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear, colorless liquid
pH, as is: 11.7
Density, lbs/gal: 8.0
Viscosity @ 25C: Water thin

Use Instructions:

Disinfection, Deodorization and Cleaning:

Spray area until completely covered. Allow product to penetrate and remain wet for 10 minutes.

Mildewstat:

Spray the surface to be treated, miking sure to wet completely. Let air dry. Repeat at weekly intervals or when mildew reappears.

For complete use instructions, see EPA registered label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.

EPA Registration No. 1839-83

SOURCE: Stepan Co.: Formulation No. 32

Disinfectant Pump Spray

Ingredients:	% by Wt.
Water	14.287
BTC 2125M (50% Active) EPA Reg. No. 1839-46	0.571
Triethylene Glycol	8.571
Isopropyl Alcohol	75.714
Triethanolamine	0.143
Fragrances:	0.714
PFW-DJY SYN802274U (Polak Frutal Works)	
Universal Fragrance #514017 (Universal Fragrance)	

Mixing Procedure:

Charge vessel with water and add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 8.5
Density, lbs/gal: 7.06
Viscosity @ 25C: Water thin

Use Instructions:

Surface Disinfection & Deodorization: Hold container 6 inches from surface and spray until completely wet. Allow to remain wet for 10 mins.

Air Deodorizing: Spray upwards in center of room for 3 secs.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Dept. for subregistration package.

EPA Registration Number 1839-82

SOURCE: Stepan Co.: Formulation No. 147

Sanitizing Agent (Powder)

Soil: Hospital soil: sebum, blood, urine, etc.
Surface: Metal, ceramic, polymeric
Application Method: Wipe, brush
Manufacture: Ribbon or paddle blender

Composition:	% Wt
STPP	30.0
Sodium Carbonate	25.0
*C12-C16 Linear Alcohol, 12 Moles EO	10.0
Metso Pentabead 20	30.0
Quaternary Germicide	5.0

Use Dilution: 0.75-1.5% bw (1-2 oz/gallon)
*BASF, Vista, Union Carbide

SOURCE: The PQ Corp.: PQ Formulary: Formula

Disinfectant/Sanitizer: BTC 1010 7.5% Solution

Ingredients:	% by Wt.
Water	90.6
BTC 1010 (80% active) EPA Reg. No. 1839-135	9.4

Mixing Procedure:

Charge vessel with water and add BTC 1010 while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
pH, as is: 6.8
Density, lbs/gal: 8.22
Viscosity @ 25C: Water thin

Use Instructions:

General Disinfection: 2.0 ozs. per 4 gallons
Hospital Disinfection: 3.5 ozs. per 4 gallons
Sanitization (food contact surfaces): 1.0 oz. per gallon
Fungicidal: 2 ozs. per 4 gallons
For complete use instructions, see EPA registered label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-152

SOURCE: Stepan Co.: Formulation No. 509

Disinfectant Cleaner (a)
Non-Phosphate Liquid Concentrate

	%w
Neodol 25-9	6.0
Germicide (b)	8.0
EDTA (c)	2.5
Sodium sesquicarbonate	2.5
Dipropylene glycol	7.0
Pine oil	4.0
Water, dye, perfume	to 100%

Properties:

Viscosity, 73F, cps: 6
Phase coalescence temp., F: 165
pH: 10.0

Use Concentration:

2 oz./gal.

(a) Cleaners making a disinfectant claim require EPA registration. If necessary, Shell can provide additional information on Neodol products to assist users in obtaining registration.
(b) Bardac 2250, Lonza., Inc., or equivalent product
(c) Ethylenediamine tetraacetic acid, tetrasodium salt (100%)

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Powder Detergent/Disinfectant

Ingredients:		% by Wt.
BTC 2125M P40 (40% Active)	EPA Reg. No. 1839-55	30.00
Urea		8.50
Sodium carbonate		3.00
Neodol 25-12		6.00
Sipernat 50		1.00
Sodium sulfate		50.85
Dyes:		0.15
FD&C yellow #10		
Nyclosan brilliant green 6FGI		
Fragrances:		0.50
Lemon 799409		
Pine fragrance J687		
Pine odor 14064		

Mixing Procedure:

Blend urea, sodium carbonate, Sipernat 50 and sodium sulfate. Add BTC 2125M P-40 and mix until homogeneous. Now add Neodol 25-12 and continue to mix until homogeneous. Add fragrance and dye and continue mix until dye is completely dispersed and homogeneous powder is obtained.

Properties:

Appearance: Free-flowing, scented powder
pH, 1% in DI water: 10.3
Density, gms/cc, tamped: 0.78

Use Instructions:

Hospital and Institutional Disinfection, dilute at 1 oz. per 2 gallons of water.

For complete use instructions, see EPA Registered Label.

Storage Stability:

This formulation is stable at 120F for 30 days. Prolonged storage should be in a cool dry place to avoid caking.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Dept. for subregistration package.

EPA Registration Number 1839-93

SOURCE: Stepan Co.: Formulation No. 323

PT 3.2 Pine Odor Disinfectant

Ingredients:	% by Wt.
Water	77.6
BTC 2125M (50% Active) EPA Reg. No. 1839-46	6.4
Ammonyx LO	10.0
Sodium Carbonate	3.0
Sodium Tripolyphosphate Anhydrous	2.0
Yarmor 302 Pine Oil	1.0

Mixing Procedure:
Charge vessel with water and dissolve sodium carbonate and STPP while mixing. Add remaining ingredients in order shown while mixing to obtain a clear solution.

Properties:
Appearance: Clear liquid
Density, lbs/gal: 8.68
pH, as is: 11.0
Viscosity @ 25C: Water thin

Use Instructions:
Disinfection-Hard Surfaces: 2.0 ozs. per gallon.
Disinfection-Toilet Bowls: 2.0 ozs. per bowl
For complete use instructions, see EPA registered label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

SOURCE: Stepan Co.: Formulation No. 143

Disinfectant Cleaner (a)
Liquid Concentrate with Phosphate

	%w
Neodol 25-9	7.5
Germicide (b)	10.0
Tetrapotassium pyrophosphate	8.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 36
Phase coalescence temp., F: 158
pH: 10.6

Use Concentration:
1-2 oz./gal.

(a) Cleaners making a disinfectant claim require EPA registration. If necessary, Shell can provide additional information on Neodol products to assist users in obtaining registration.
(b) Bardac 2250, Lonza, Inc., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formula

PT 4.0 Pine Scent Disinfectant/Detergent

Ingredients:	% By Wt.
Water	78.5975
Isopropyl alcohol	8.6500
Neutronyx 656	4.5000
BTC 2125M (50% Active) EPA Reg. No. 1839-46	4.0000
Natrosol 250MR	0.2500
Unipine NCL Reg. No. 9886-9	4.0000
Pylaklor Brown LX4911	0.0025

Mixing Procedure:

Charge vessel with water and add remaining ingredients as shown while mixing until homogeneous.

Properties:

Appearance: Clear liquid
pH, as is: 6.5
Density, lbs/gal: 8.22
Viscosity @ 25C: Water thin

Use Instructions:

Hospital and General Disinfection:
Dilute 4 ozs. per gallon of water.
Toilet Bowls: Add 4 ozs. directly to bowl.
For complete use instructions, see EPA registered label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days

SOURCE: Stepan Co.: Formulation No. 90

Disinfectant Cleaner (a) Hospital/Clinical Strength

	%w
Neodol 25-9	7.0
Germicide (b)	15.0
EDTA (c)	6.0
Sodium carbonate	3.0
Bactericide (d)	10.0
Propylene glycol	5.0
Water	to 100%

Properties:

Viscosity, 73F, cps: 31
Phase coalescence temp., F: >165
pH: 11.2

Use Concentration:

For hospital use: 2 oz./gal.
For institutional, non-hospital use: 1 oz./gal.
(a) Cleaners making a disinfectant claim require EPA registration. If necessary, Shell can provide additional information on Neodol products to assist users in obtaining registration.
(b) Bardac 2250, Lonza., Inc., or equivalent product.
(c) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis)(d) Barquat MB-50, Lonza, Inc., or equivalent product

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations:Formula

Veterinarian Type Disinfectant

Ingredients:	% by Wt.
Water	64.0
BTC 2125M (50% Active) EPA Reg. No. 1839-46	18.0
EDTA (38%)	5.0
Neutronyx 656	9.0
Sodium carbonate	4.0

Mixing Procedures:

Charge vessel with water and add sodium carbonate while mixing until a homogeneous solution is obtained. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:

Appearance: Clear liquid
Density, lbs/gal.: 8.75
pH, as is: 12.0
Viscosity @ 25C: Water thin

Use Instructions:

Disinfection, Deodorization and Cleaning:
Dilute 1.0 oz. per gallon of water. Allow surface to remain wet for 10 minutes.

Mildewstat:
Dilute 1.0 oz. per gal. of water, making sure to wet all surfaces completely. Repeat at weekly intervals or when mildew reappears.

For complete use instructions, see EPA registered label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Dept. for subregistration package.

EPA Registration Number 1839-100

SOURCE: Stepan Co.: Formulation No. 44

Sanitizing Cleaner (Powder)

Soil: Hospital soil: sebum, blood, urine, etc.
Surface: Metal, ceramic, polymeric
Application Method: Wipe or brush
Manufacture: Ribbon or paddle blender

Composition:	%Wt
Metso Beads 2048	20.0
Sodium Carbonate	35.0
STPP	30.0
*Sodium Dichloroisocyanurate, 2H2O	10.0
**Sodium Alkylaryl Sulfonate Powder (90%)	5.0

Use Dilution: 0.75-1.5% bw (1-2 oz/gallon)
* Olin Chemical
**Stepan, Witco

SOURCE: The PQ Corp.: PQ Formulary: Formula

20% Veterinarian Type Disinfectant

Ingredients:	% by Wt.
Water	33.92
BTC 2125M (50% Active) EPA Reg. No. 1839-46	40.00
EDTA (38%)	14.40
Neutronyx 656	11.20
Sodium sesquicarbonate	0.48

Mixing Procedure:
Charge vessel with water and add sodium sesquicarbonate while mixing until homogeneous solution is obtained. Add remaining ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:
Appearance: Clear liquid
pH, as is: 11.3
Density, lbs/gal: 8.66
Viscosity @ 25C: Water thin

Use Instructions:
Disinfection: Add 10 mls. to 1 gallon of water and wet all surfaces thoroughly. Allow to remain wet for 10 minutes. Then let air dry.

Mildewstat: Add 10 mls. to 1 gallon of water. Apply solution making sure to wet all surfaces. Repeat application at weekly intervals or when mildew reappears.

For complete use instructions, see EPA registered label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Dept. for subregistration package.

EPA Registration Number 1839-109

SOURCE: Stepan Co.: Formulation No. 45

Germicidal Disinfectant (Concentrate)*

Formulation:	Wt.%
Dowicide 1 antimicrobial	2.0
Dowanol DPM (or 1:1 PnB:DPM) glycol ether	10.0
Dowfax 2A1 surfactant	1.0
Sodium dodecyl benzene sulfonic acid	1.0
Water	86.0

* This germicidal cleaner formulation has not been registered with the Environmental Protection Agency (EPA). Any formulation which you choose to market with germicidal, disinfectant-type claims must be registered with the EPA as required by Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

SOURCE: The Dow Chemical Co.: Dowanol Glycol Ethers: Formulas

6. General Purpose Cleaners

Ajax Type All-Purpose Cleaner

Ingredients:	% wt/wt
Amphoterge K-2 (40% sol'n)	6.0
Unamide C-72-3	4.0
Sodium metasilicate pentahydrate	4.0
Sodium sesquicarbonate	5.0
Ammonium Hydroxide (28% sol'n.)	3.0
Opacifier E-295 (40% sol'n)	0.2
Water	77.8

pH approximately 11.0

Preparative Procedure:

Into 90% of the total water, dissolve the Sodium metasilicate and the Sodium sesquicarbonate. Add the Amphoterge K-2 and the Unamide C-72-3 with stirring after each addition until a clear solution is obtained. In a separate vessel, disperse the Opacifier E-295 into the remaining water and stir the mixture into the batch. Finally, add the Ammonium Hydroxide, stirring for an additional five minutes to insure batch uniformity.

Formula O-31-4

All-Purpose Spray Cleaner

Ingredients:	% wt/wt
Hampene 100 (40% active)	4.0
Sodium metasilicate pentahydrate	1.0
Barlox 12	2.0
Alkawet CF	1.0
Propylene glycol mono methyl ether	3.0
Water	89.0

pH= 11.0-11.5

Preparative Procedure:

To the water, while stirring, add all of the ingredients in the order listed. Continue stirring until a clear solution results.

SOURCE: Lonza Inc.: Formula R-4-16

All Purpose Cleaner

Ingredients:	% by Wt.
Ammonyx LO	10.0
Ninol 11-CM	5.0
Na3NTA or Na4 EDTA	5.0
Stepanate SXS	2.5
Water, D.I.	77.5

Mixing Procedure:
Dissolve NTA or EDTA in water. Add surfactants while under agitation. Mix until clear.

Properties:
Appearance: Clear, light yellow liquid
pH, as is: 10.0
Viscosity @ 25C, cps: 125
Solids, %: 14.0

Use Instructions:
Dilute 1-4 ozs of product in 1 gallon of water.

Performance:
Gardner Straight Line Washability Test:
Above formulation: 48.0% soil removed from tiles.
Commercial Products: 21-22% soil removed from tiles.

Comment:
Ammonyx LO and Ninol 11-CM are excellent hard surface cleaning surfactant combinations. Ammonyx LO is mild to the hands. Formulation is biodegradable.
Formulation No. 251

All Purpose Cleaner (Pine Odor)

Ingredients:	% by Wt.
Water	79.8
TKPP	5.0
Bio-Soft D-62	5.0
Ninol 1281	10.0
Pine oil	0.2

Mixing Procedures:
Blend ingredients in order given

Properties:
Appearance: Clear, light, yellow liquid
pH, as is: 9.5
Viscosity, @ 25C, cps: 175
Active, %: 20.2

Use Instructions:
Dilution Ratio: 1-4 oz./gallon as needed.

SOURCE: Stepan Co.: Formulation No. 82

All Purpose Cleaner

Ingredients:	% by Weight
Water	75.0
NA3NTA	5.0
Stepanate SXS	5.0
Bio-Soft D-62	5.0
Ninol 11-CM	10.0

Mixing Procedure:
Mix in the order given above

Properties:
Appearance: Clear, light, yellow liquid
pH, as is: 9.5
Viscosity, @ 25C, cps: 95
Active, %: 20.0

Use Instructions:
Dilute 1 to 2 ozs in one gallon of water
Formulation No. 124

All Purpose Cleaner

Ingredients:	% by Weight
Water	75.0
TKPP	5.0
Stepanate SXS	5.0
Bio-Soft D-62	5.0
Ninol 11-CM	10.0

Mixing Procedure:
Mix in the order given above

Properties:
Appearance: Clear, light, yellow liquid
pH, as is: 9.5
Viscosity, @ 25C, cps: 90
Active, %: 20.0

Use Instructions:
Dilute 1 to 2 ozs in one gallon of water
Formulation No. 125

SOURCE: Stepan Co.: Formulations

All Purpose Cleaner

Ingredients:	% by Wt.
Water D.I.	76.1
TKPP	5.0
Stepanate SXS	5.3
NaOH (50%)	0.8
Bio-Soft S-100	2.8
Ninol 11-CM	10.0

Mixing Procedure:
Mix in the order given above.

Properties:
Appearance: Clear, light, yellow liquid
pH, as is: 9.5
Viscosity @ 25C, cps: 90
Solids, %: 20.0

Use Instructions:
Dilute 1 to 2 ozs of product in 1 gallon of water.

Formulation No. 330

All Purpose Cleaner

Ingredients:	% by Wt.
Water, D.I.	76.1
Na3NTA or Na4EDTA	5.0
Stepanate SXS	5.3
NaOH (50%)	0.8
Bio-Soft S-100	2.8
Ninol 11-CM	10.0

Mixing Procedure:
Mix in the order given above.

Properties:
Appearance: Clear, light yellow liquid
pH, as is: 9.5
Viscosity @ 25C, cps: 95
Solids, %: 20

Use Instructions:
1 to 2 oz/gal. Can be used to clean all washable surfaces such as floors, walls, kitchen and bathroom surfaces, appliances, etc.

SOURCE: Stepan Co.: Formulation No. 331

All-purpose Cleaner

Formulation:	Wt.%
Water	79.0
Trisodium phosphate	4.0
DOWANOL PnB glycol ether	4.0
Ninol 1285 alkylolamide	3.0
Unipine 85 pine oil	3.0
Sodium xylene sulfonate (40%)	7.0

Notes: Combine first two components and stir to dissolve solids.
Add remaining components in order listed.
Cleaner is slightly cloudy and colorless.

All-Purpose Cleaner

Formulation:	Wt.%
Water	77.0
Sodium metasilicate (Metso Beads 2048)	1.0
Sipex BOS sulfate	3.0
Siponic SK surfactant	2.0
Dowanol PnB glycol ether	10.0
Sodium xylene sulfonate (40%)	5.0
Monoethanolamine	2.0

Notes: Combine first two compoments and stir to dissolve solids.
Add remaining components in order listed.
Cleaner should be clear and colorless.

Variations:
1) DPnB can be substituted for PnB directly.
2) A DPnB/DPM blend can also be used with these changes:

Water	76.5%
DPM glycol ether	2.5%
DPnB glycol ether	2.5%
Sodium carbonate	4.0%

SOURCE: Dow Chemical Co.: All-Purpose Cleaners 8, 9

All-Purpose Cleaner

Formulation:	Wt%
Miranol C2M-SF amphoteric	25.0
Alfonic 1012-40 additive	13.0
Dowanol PnB glycol ether	14.0
Mineral spirits	45.0
Triethanolamine 85	3.0

Notes: Mix in order listed. A yellow gel will form with the mixing of the first two chemicals but will thin with the addition of the others. Cleaner should be clear and yellow-orange in color.

All-Purpose Cleaner

Formulation:	Wt%
Water	78.0
Sodium carbonate	2.5
Versene 100 chelating agent	2.0
Sodium xylene sulfonate (40%)	4.0
Dowanol PnB glycol ether	5.0
Ethanol	1.5
Tergitol 24-L-60 surfactant	7.0

Notes: Combine first two components and stir to dissolve solids. Add remaining components in order listed. Cleaner should be colorless.

Variations:
1) DPnB can be substituted for PnB directly.
2) A DPnB/DPM blend can also be used with these changes:

Water	76.5%
DPM glycol ether	2.5%
DPnB glycol ether	2.5%
Sodium carbonate	4.0%

SOURCE: Dow Chemical Co.: All Purpose Cleaners 10, 11

All-Purpose Cleaners
Abrasive Cleaner, Liquid

Ingredient:	Wt.%
Water	33.64
Acrysol ASE-108 (18%)	7.06
Sodium Hydroxide (10%)	4.30
Sodium Tripolyphosphate (2)	2.50
Triton X-102	2.50
Berkeley 230 Mesh or Berkeley 160 Mesh Supersil	50.00

2) Monsanto Co.. STP Code 067

Alkaline Cleaner, Heavy Duty

Ingredient:	Wt.%
Mirataine H2C	5.0
Sodium Metasilicate, pentahydrate	3.0
Trisodium Phosphate, crystalline (2)	1.3
Sodium Tripolyphosphate (3)	1.5
Actinol FA-2	1.7
Potassium Hydroxide, 45%	1.0
Dowanol EB	9.0
Water	77.5

2) Monsanto Co. TSP-C Code 105
3) Monsanto Co. STP Code 067

Alkaline Industrial Cleaner

Ingredient:	Wt.%
Sodium Tripolyphosphate (1)	52.5
Sodium Carbonate, light density	20.0
Sodium Metasilicate, pentahydrate	22.5
Gafac RA-600 (2)	5.0

2) Monsanto Co. STP Code 067

Food Processing Equipment Cleaner, Spray

Ingredient:	Wt.%
Triton CF-76	2.0
Sodium Tripolyphosphate (2)	50.0
Sodium Metasilicate, anhydrous	31.0
Soda Ash	15.0
ACL 60 Chlorinating Comp. (3)	2.0

2) Monsanto Co. STP Code 101
3) Monsanto Co.
Use Level: 2-4 oz./gal. water

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formulas

All-Purpose Cleaners
Hard Surface Cleaner

Ingredient:	Wt.%
Water	73.5
Sodium Tripolyphosphate (1)	5.0
Trisodium Phosphate, Crystalline (2)	5.0
Bio-terge PAS-8S	7.5
Makon 8	9.0

1) Monsanto Co., STP Code 067
2) Monsanto Co., TSP-C Code 105

Hard Surface Cleaner, Ammoniated

Ingredient:	Wt.%
Neodol 23-6.5	5.0
Sodium Tripolyphosphate (2)	27.0
Ammonium Chloride	1.0
Sodium Carbonate	67.0

2) Monsanto Co. STP Code 101

Chlorinated Cleaner-Sanitizer

Ingredient:	Wt.%
Sodium Carbonate, light density	25.0
Sodium Tripolyphosphate (1)	30.0
Sodium Chloride	25.0
Sodium Metasilicate, pentahydrate	5.0
ACL 60 Chlorinating Comp. (2)	4.0
Makon 10 (3)	1.0
Bio-Terge PAS-8S (3)	10.0

1) Monsanto Co. STP Code 067
2) Monsanto Co.
Use Level: 1/2-3 oz./gal.

Chlorinated Cleaner-Sanitizer

Ingredient:	Wt.%
Sodium Carbonate, light density	15.0
Sodium Tripolyphosphate (1)	25.0
Sodium Metasilicate, pentahydrate	25.0
ACL 60 Chlorinating Comp. (2)	1.6
Sodium Sulfate	28.4
Makon 10	1.0
Bio-Terge PAS-8S	4.0

1) Monsanto Co. STP Code 067
2) Monsanto Co.

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formulas

All-Purpose Cleaner

Composition:	%
Kelzan xanthan gum	0.3
Alipal CD-128	1.7
Gafamide CDD 518	0.5
Butyl Cellosolve	3.5
Sodium Metasilicate	1.7
Trisodium Phosphate	1.0
Water, Perfume	91.3

Procedure:

Prepare water solution of Kelzan xanthan gum by adding slowly with constant agitation. Add other ingredients as indicated. For aerosol use charge with approximately 85 percent concentration and 15 percent Genetron 12.

SOURCE: Kelco Division: Suggested Formulation

All-Purpose Cleaner

Triton XL-80N Surfactant	4.0
Triton H-66 Surfactant (50%)	5.0
Sodium Hydroxide (50%)	4.0
Sodium Silicate	14.0
Trisodium Phosphate, TSP	1.6
Water	71.4

SOURCE: Union Carbide Corp.: Starting Formulation

All Purpose Non-Caustic Cleaner

	Wt.%
Water	81.0
Tetrapotassium Pyrophosphate	10.0
Sodium Metasilicate Anhydrous	5.0
Tomah Alkali Surfactant	2.0
Nonionic Surfactant	2.0

pH: 12.5
SpG: 1.122 @ 74F.
Wt./Gal.: 9.35 @ 74F.

SOURCE: Exxon Chemical: Formulary: Formulas

All Purpose Cleaner Concentrate (Liquid, Foam)

Soil: Grease and oil
Surface: Paint, polymeric, metal
Application Method: Spray
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	78.1
Metso Beads 2048	2.4
TKPP (60%)	3.0
*Phosphate Ester	3.0
**Dipropylene Glycol Monomethyl Ether	6.0
***Octylphenoxy Polyethoxyethanol, 9-10 moles EO	5.0
***Octylphenoxy Polyethoxyethanol, 5 moles EO	2.5

Use Dilution: Normal Duty: 1.5% bw (2 oz/gallon)
Heavy Duty: 2.5% bw (3.3 oz/gallon)
Tough Duty: as supplied

* Mona Industries, Rohm & Haas
** Dow, Arco Chemical
*** Rohm & Haas, GAF

All Purpose Concentate (Liquid)

Soil: Grease and oil
Surface: Paint, polymeric, metal
Application Method: Wipe or brush
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	78.75
Metso Beads 2048	1.00
TKPP	3.00
Sodium Xylene Sulfonate, 40%	3.50
*Ethylene Glycol n-Butyl Ether	6.00
Pine Oil	0.25
**C12-C13 Linear Alcohol, 6.5 Moles EO	5.00
**C12-C15 Linear Alcohol, 3 Moles EO	2.50

Use Dilution: 1.5-3.0% bw (2-4 oz/gallon)

*Dow, Union Carbide
**Shell, Union Carbide, Vista

SOURCE: The PQ Corp.: Formulas

All-Purpose Heavy Duty Cleaner

Ingredients:	%wt/wt
Amphoterge K	10.0
Sodium metasilicate pentahydrate	15.0
Sodium carbonate	5.0
Ethylene diamine tetraacetic acid, tetrasodium salt (38% sol'n.)	5.0
Ammonium hydroxide (28% sol'n.)	3.5
Water	61.5

Preparative Procedure:

Charge the mixing vessel with all of the water. While mixing, add the EDTA Na4, sodium carbonate and sodium metasilicate pentahydrate. When a clear solution has been obtained, add the Amphoterge K followed by the ammonium hydroxide. Continue mixing until a clear solution has been obtained.

Formula N-107-2

All-Purpose Heavy Duty Industrial Cleaner

Ingredients:	% wt/wt
Amphoterge KJ-2	10.0
Sodium carbonate	7.0
Ethylene diamine tetraacetate tetrasodium salt (38% sol'n)	5.0
Potassium hydroxide (45% sol'n)	4.0
Kasil No. 1	30.0
Water	44.0

Preparative Procedure:

Charge the mixing vessel with all the water. Slowly add the potassium hydroxide followed by the sodium carbonate, Kasil No. 1 and EDTA Na4. Mix until fully dissolved, then add the Amphoterge KJ-2. Allow to stir until clear.

Formula Y-52-1

Non-Phosphate All-Purpose Heavy Duty Industrial Cleaner

Ingredients:	% wt/wt
Lonzaine CS	5.0
Sodium metasilicate pentahydrate	30.0
Sodium carbonate	5.0
Ethylenediamine Tetraacetate tetrasodium salt (38% sol'n.)	5.0
Water	55.0

Preparative Procedure:

Charge the mixing vessel with all the water. Slowly add the sodium metasilicate pentahydrate followed by the sodium carbonate and the EDTA Na4. Mix until fully dissolved, then add the Lonzaine CS. Allow to stir until clear.

SOURCE: Lonza Inc.: Formula C-63-1

All Purpose Spray Cleaner

Component:	Wt.%
Alfonic 810-60 Ethoxylate	2.0
C-560 LAS	1.0
Tetrapotassium Pyrophosphate (TKPP)*	1.7
Sodium Metasilicate Pentahydrate	0.5
Water, perfume, dye	q.s.

q.s.:quantity sufficient to make 100 percent
* 60% active

Properties:
Approximate pH: 12.5
Cloud/clear (F): below 40F

Order of Addition:
Water, TKPP, Silicate, Alfonic 810-60, C-550 LAS

Multi-Purpose Cleaner Concentrate

Component:	Wt.%
Alfonic 810-60 Ethoxylate	10.0
SXS or STXS*	28.3
Ethylenediaminetetraacetic Acid (EDTA) Tetrasodium Salt	10.0
Sodium Metasilicate, anhydrous	5.0
Water, perfume, dye	q.s.

q.s.: quantity sufficient to make 100 percent
* 40% active

Properties:
Approximate pH: 13.5
Cloud/clear (F): below 40F

Order of Addition:
Water, EDTA, Silicate, SXS, Alfonic 810-60 AE

SOURCE: Vista Chemical Co.: Formulas

All Purpose Cleaner/Degreaser "Simple Green" Type

Components:	% by Weight
Water	77.1%
TKPP	2.5
Burco TME	4.0
Burco AAS-40	6.0
Butyl Propasol	6.0
Varsol	1.0
SXS	3.4
Dyes	as desired

SOURCE: Burlington Chemical Co., Inc.: Formula

General Purpose Cleaner--Household

Raw Materials:	% by Weight
Tetrapotassium pyrophosphate	8
Dodecylbenzene sulfonate, TEA salt	4
Surfonic N-95	4
Lauric diethanolamide	2
Sodium xylene sulfonate	6
Water	76

General Purpose Cleaner--Industrial

Raw Materials:	% by Weight
Tetrapotassium pyrophosphate	4
Dodecylbenzene sulfonate, TEA salt	4
Surfonic N-150	5
Lauric desthanolamide	1
Water	86

All-Purpose Cleaner

Raw Materials:	Parts by Weight
Surfonic N-60/N-95* (Blend 20-25%/80-75%)	1.7
Cocodiethanolamide or Lauric Diethanolamide	0.5
Trisodium Phosphate	1.0
Sodium Metasilicate, 5H2O	1.7
Ethylene glycol monobutyl ether	3.5
Water, dye, perfume	q.s. to 100

* Or Surfonic N-85 by itself.

SOURCE: Texaco Chemical Co.: Formulations

All Purpose (Non-Phosphate) Cleaner

	% by Weight
Water	88.3%
Caustic Soda Flakes	0.7%
Monamine ALX-100S	6.0%
Butyl Cellosolve	2.0%
Sodium Carbonate	2.0%
Hampene 100	1.0%

Add ingredients in order listed.

SOURCE: Mona Industries, Inc.: MONAMINE ALX-100S: Formula

General Purpose Spray and Wipe Cleaner

Ingredients	% by Wt.
Water	92.5
Sodium metasilicate anhydrous	1.0
NTA	2.0
Butyl cellosolve	3.0
Ninol 1281	1.5

(Dye and perfume may be added as required)

Mixing Procedure:

Charge tank with water. Dissolve NTA and metasilicate. Add remaining ingredients in the order listed above while mixing.

Properties:

Appearance: Clear liquid
pH, as is: 11.5
Viscosity, @ 25C, cps: 15

Use Instructions:

Can be used in a trigger spray bottle

Comment:

Similar in function to Fantastik
Formulation No. 91

Spray and Wipe Cleaner

Ingredients:	% by Weight
Water	90.5
NA3NTA	2.0
Sodium metasilicate, anhydrous	1.0
Butyl cellosolve	3.0
Bio-Terge PAS-8S	3.0
Makon 8	0.5

Mixing Procedure:

Mix in the order given above

Properties:

Appearance: Clear liquid
pH, as is: 11.5
Viscosity, @ 25C, cps: 15

Use Instructions:

Spray as is from spray bottle onto surface to be cleaned. Wipe clean with a paper towel.

Comment:

Can be used as a white wall tire cleaner, all-purpose, spray cleaner (except glass)

SOURCE: Stepan Co.: Formulation No. 123

General Purpose Spray and Wipe Cleaner

Ingredients:	% by Weight
Ninol 11-CM	2.0
Bio-Soft EA-10	2.0
Bio-Terge PAS-8S	3.0
Na4EDTA (100%)	2.0
d-Limonene	3.0
D&C Green #8	0.001
Water, D.I.	87.9

Mixing Procedure:
Mix d-Limonene, Ninol 11-CM, and Bio-Soft EA-10 until clear. Predissolve EDTA in water and add to surfactant mixture slowly with high agitation. Lastly add Bio-Terge PAS-8S and dye while mixing. Product will be opaque prior to the addition of PAS.

Properties:
Appearance: Fluorescent green liquid
pH, as is: 10.0
Odor: Citrus
Density, lbs/gal: 8.34
Viscosity @ 25C: water-thin

Use Instructions:
Use as is from a trigger spray bottle.

Performance:
Gardner Straight Line Washability Test:
Above formulation: 75.0% soil removed from tiles
Commercial product: 80.0% soil removed from tiles
Formulation No. 198

General Purpose Spray & Wipe Cleaner

Ingredients:	% by Wt.
Steol CS-460	5.00
Bio-Soft S-100	1.68
Stepanate SXS	5.75
TKPP	3.00
Potassium hydroxide	0.70
Water, D.I.	83.87

Mixing Procedure:
Combine water, potassium hydroxide, and Stepanate SXS. Slowly add Bio-Soft S-100 with agitation. Adjust pH to 7.0-8.0 with sulfuric acid or potassium hydroxide. Dissolve TKPP and Steol CS 460. Mix until clear and homogeneous.

Properties:
Appearance: Clear, light yellow liquid
pH, as is: 10.0
Viscosity @ 25C, cps: 12

Use Instructions:
Can be used as is from a trigger spray bottle.

SOURCE: Stepan Co.: Formulation No. 211

General Purpose Spray and Wipe Cleaner

Ingredients:	% by Wt.
Water, D.I.	90.5
Stepanate SXS	2.0
Na4EDTA	2.0
Sodium metasilicate, anhydrous	1.0
Butyl cellosolve	3.0
Bio-Soft LD-190	1.5

Mixing Procedure:
Blend ingredients in order given.
Properties:
Appearance: Clear liquid
Viscosity @ 25C, cps: 4
pH, as is: 12.4
Density, lbs/gal: 8.47
Use Instructions:
Use as is in spray trigger spray bottle. Spray on and wipe off with clean cloth or paper towel.
Formulation No. 299

Neutral All Purpose Cleaner - No Rinse

Ingredients:	% by Wt.
Water	62.8
Stepanate SXS	15.0
Versene 100 (38%)	5.0
Butyl Carbitol or Dowanol BD or Butyl Dioxitol	6.0
Ninol 11-CM	10.0
Citric acid	1.2

Mixing Procedure:
Charge vessel with water and add ingredients in order shown while mixing to obtain a homogeneous solution.
Typical Properties:
Appearance: Clear liquid
pH, as is: 7.6
pH @ Use Dilution (tap water): 7.5
Density @ 25C, lbs/gal: 8.7
Viscosity @ 25C, cps: Water thin
Storage Stability:
Formulation is freeze/thaw stable. It will return to its original state upon thawing.
Use Instructions:
Formulation is a concentrated cleaner. For best results dilute at 2-4 ozs. per gallon of water.

SOURCE: Stepan Co.: Formulation No. 378

Wall/Tile/Floor Cleaners
Regular Duty, All Purpose

	%w
Neodol 25-3S (60%)	6.7
Neodol 91-6	6.0
FADEA (a)	2.0
Trisodium phosphate, anhydrous basis	2.0
Sodium metasilicate, pentahydrate	13.9
Isopropyl alcohol (b)	2.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 14
- Phase coalescence temp., F: 140
- pH: 13.2

Light Duty, All Purpose

	%w
Neodol 91-6	5.0
Trisodium phosphate, anhydrous basis	2.0
Sodium metasilicate, pentahydrate	3.5
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 8
- Phase coalescence temp., F: 106
- pH: 12.3

Heavy Duty, All Purpose Spray

	%w
Neodol 25-3S (60%)	2.5
Neodol 23-6.5	3.0
EDTA (c)	3.0
Sodium sesquicarbonate	3.0
Butyl Oxitol glycol ether (d)	3.0
Isopropyl alcohol	2.0
Sodium xylene sulfonate (40%)	1.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 2
- Phase coalescence temp., F: >165
- pH: 12.6

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Wall/Tile/Floor Cleaners
Regular Duty, All Purpose Spray

	%w
Neodol 25-3S (60%)	0.8
Neodol 23-6.5	1.7
FADEA (a)	0.5
Sodium metasilicate, pentahydrate	1.7
Trisodium phosphate, anhydrous basis	1.0
Butyl Oxitol glycol ether (d)	3.5
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 2
Phase coalescence temp., F: >165
pH: 10.0

(a) Fatty acid diethanolamide, Ninol 49 CE, Stepan Co., or equivalent product.
(d) Shell Chemical Co.

Regular Use Ammoniacal Powder

	%w
Neodol 23-6.5	5.0
Sodium tripolyphosphate	27.0
Ammonium chloride	1.0
Sodium carbonate	67.0

Blending Procedure for Powder Only:
Mix solid builders thoroughly. Add surfactant slowly while mixing, mix thoroughly.

Source: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

7. Hard Surface Cleaners

All Purpose Hard Surface Cleaner

	% By Weight
Tetrapotassium Pyrophosphate	10
Sodium Metasilicate	2
Sodium Carbonate	2
Monatrope 1250 (as supplied)	5
Igepal CO-710	3

Cloud Point: 70C
Recommended Use Dilution: 1:50
SOURCE: Mona Industries, Inc.: MONATROPE 1250: Formulas

Hard Surface Cleaner

	%
Sodium xylenesulfonate (50%)	12.0
Ethylenediaminetetraacetic acid, tetrasodium salt (100%)	9.6
Poly-Tergent SL-42	8.0
Sodium metasilicate, anhydrous	6.4
Water, fragrance and dye	Balance

Paint and Woodwork Cleaner (Liquid)

	%
Poly-Tergent B-350 or SL-92	4-6
Tetrasodium pyrophosphate, anhydrous, powder	2-4
Water	Balance

(To use: Dilute one ounce to a gallon of water)
SOURCE: Olin Chemicals: POLY-TERGENT Surfactants: Formulas

Hard Surface Cleaner for Wood Surfaces

Ingredients:	% by Wt.
Ninol 5024	20.0
Na4 EDTA (39%)	2.5
Water	77.5

Mixing Procedure:
Charge tank with warm water. Add EDTA and mix. Add Ninol 5024 slowly with agitation. Continue mixing until clear and homogeneous.
Properties:
Appearance: Clear, light yellow liquid
Viscosity @ 25C, cps: 240
pH, as is: 10.0
Solids, %: 21.0
Density, lbs/gal: 8.4
Use Instructions:
2-4 oz/gal in warm water. After washing, wipe surface dry with a clean, dry cloth.
Performance:
Gardner Straight Line Washability Test:
Above formulation: 30.0% soil removed from tiles
Commercial oil soap: 8.0% soil removed from tiles
Comment:
Above formulation cleans wood and other washable surfaces effectively while preserving the natural finish of wood, paint or varnish. This product is readily biodegradable. The physical properties are very similar to commercially available oil soaps.
SOURCE: Stepan Co.: Formulation No. 521

Concentrated Hard Surface Cleaner

Ingredients:	% by Wt.
Kerosene, deodorized	26.0
Ninol 11-CM	12.3
Makon 12	7.0
Ammonyx LO	0.7
Butyl Cellosolve or Butyl Carbitol	10.0
Na4 EDTA	0.4
Water, D.I.	43.6

Mixing Procedure:

Combine kerosene, surfactants and Butyl Cellosolve and mix until clear. Add water slowly with high agitation and mix until clear. Add Na4EDTA and mix until dissolved.

Properties:

Appearance: Clear, yellow liquid
Density, lbs/gal: 8.0
pH, 10% aqueous: 9.0
Viscosity @ 25C, cps: 50

Use Instructions:

Use 1 to 2 oz/gal for cleaning floors and walls. Use full strength to remove oil, grease, tar, gum, asphalt, fresh paint, adhesives, scuff marks and lipstick stains. Brush where necessary. Rinse with water. For prolonged use, wear rubber gloves.

Gardner Straight Line Washability Test:

Above Formuulation: 54.0% soil removed from tiles
Commercial product: 39.0% soil removed from tiles
Formulation No. 252

Hard Surface Cleaner

Ingredients:	% by Wt.
d-Limonene	30.0
Ninol 11-CM	20.0
Butyl Carbitol	10.0
Na4 EDTA	1.0
Water, D.I.	39.0

Mixing Procedure:

Add first three ingredients and mix well. Combine water and EDTA and add slowly with high agitation.

Properties:

Appearance: Clear yellow liquid
Odor: Citrus
pH, as is: 9.5
Viscosity @ 25C, cps: 50
Density, lbs/gal: 8.0

Use Instructions:

Use as is or dilute as necessary.

Performance:

Gardner Straight Line Washability Test:
Above formulation: 70% soil removed from tiles
Commercial products: 20-32% soil removed from tiles

SOURCE: Stepan Co.: Formulation No. 205

Creamy Hard Surface Cleaner

Material:	% by Weight
Water	52.0
Kaopolite 1168	12.0
Tetra Potassium Pyrophosphate	6.0
Sodium Triphosphate	7.0
Sodium Silicate	5.0
Butyl Cellosolve	4.0
Sodium Xylene Sulfonate (40%)	6.0
Dodecyl benzyl sulfonic acid	8.0

Procedure:
(1) Blend Kaopolite 1168 into water with high shear mixing.
(2) Add other ingredients in order listed to give good creamy consistency.

Liquid Gentle Abrasive Cleanser for All Non-Porous Hard Surfaces

Ingredients:	Percent by Weight
(1) Deionized water	53
(2) Kaopolite SF or 1168	42
(3) Sodium carbonate, anhydrous	1
(4) Tetrasodium pyrophosphate, anhydrous	1
(5) Sodium metasilicate, pentahydrate	1
(6) Triton X-100	2

Procedure:
Add (2) slowly to (1), with vigorous agitation, continuing several minutes until well-disintegrated and smooth. Add (3), (4) and (5) with stirring to dissolve. Reduce agitation to avoid excessive foaming, slowly add (6).

Comment:
Deaeration of product may be helpful to avoid development of false body on storage. Use of the Kaopolite 1168 gives more aggressive cleaning and polishing action to the formulation.
SOURCE: Kaopolite, Inc.: Suggested Formulations

Non-Butyl Hard Surface Cleaner

Water	86.5 Wt.%
Sodium Metasilicate Anhydrous	2.5
Tetrasodium Pyrophosphate	1.0
50% NaOH	4.5
Versene 100	1.5
Tomah AO-14-2	1.0
Tomah Q-14-2	1.0
Nonionic Surfactant	2.0

pH: 12.5
SpG: 1.035 @ 74F.
Wt./Gal.: 8.62 @ 74F.
SOURCE: Exxon Chemical Co.: 1992 Formulary: Cleaning Formulations

Hard Surface Cleaner

Ingredients:	% by Wt.
Water, D.I.	57.5
Sodium citrate	15.0
Sodium carbonate	5.0
Ammonia (29.7%)	3.5
Stepanate SXS	8.0
Ninol 11-CM	10.0
Opacifier E-305 (10%)	1.0

Mixing Procedure:

Dissolve builders in water. Add remaining ingredients in the order shown above while mixing.

Properties:

Appearance: Opaque liquid
Odor: Ammonia
pH, as is: 10.5
Solids, %: 33.5
Viscosity @ 25C, cps: 100

Use Instructions:

Apply 2-4 oz/gal solution to the surface with a mop or sponge. Then wipe or rinse.

Performance:

Removes greasy soils very effectively.
Formulation No. 209

Hard Surface Cleaner

Ingredients:	% by Wt.
d-Limonene	30.0
Ninate 411	10.0
Makon 8	10.0
Bio-terge PAS-8S	10.0
Water, D.I.	39.9
D&C Green #8	0.1

Mixing Procedure:

Charge tank with d-Limonene. Add Ninate 411 and Makon 8, mix until clear and uniform. Add water slowly while mixing. Add Bio-Terge PAS-8S while under agitation. D&C green dye should be predissolved in water and then added. Mix until homogeneous.

Properties:

Appearance: Clear green fluorescent liquid
Viscosity @ 25C, cps: 200
Density, lbs/gal: 8.0
pH (10%): 4.5
Freeze/thaw (3 cycles): Pass
50C oven (1 week): Pass

Use Instructions:

Use as is or dilute with water as required.

Performance:

Removes graffiti, tar, grease, chewing gum and oily soils very effectively and safely. Excellent for both indoor and outdoor use.

SOURCE: Stepan Co.: Formulation No. 256

Hard Surface Cleaner

Formulation:	Wt.%
Water	89.0
Potassium pyrophosphate	3.0
Dowanol PnB glycol ether	4.0
Neodol 91-6 ethoxylate	4.0

Notes: Combine first two components and stir to dissolve solids. Add remaining components in order listed. Cleaner may be a little cloudy and colorless.

Formulation No. 26

Hard Surface Cleaner

Formulation:	Wt.%
Water	74.5
Sodium metasilicate (Metso Beads 2048)	2.0
Potassium pyrophosphate	2.0
Dowanol PnB glycol ether	6.0
Sodium xylene sulfonate	4.0
Witconate 1260 emulsifier	4.0
Igepal CO-630 surfactant	7.5

Notes: 1-2 oz/gallon water for regular use. 18-20 oz/gallon water for tough jobs. Combine first three components and stir to dissolve solids. Cleaner may be slightly cloudy or colorless.

Formulation No. 28

Hard Surface Cleaner

Formulation:	Wt.%
Water	80.0
Sodium metasilicate (Metso Beads 2048)	2.0
Potassium pyrophosphate	4.0
Dowanol PnB glycol ether	4.0
Witconate 1250 emulsifier	2.0
Sodium xylene sulfonate (40%)	6.0
Plurafac D-25 surfactant	2.0

Notes: Combine first three components and stir to dissolve solids. Combine remaining components in separate container and stir to initial mixture.

Cleaner may be cloudy at first but will clear.

Formulation No. 29

SOURCE: The Dow Chemical Co.: Hard Surface Cleaners: Formulas

Hard Surface Cleaner

Formulation:	Wt.%
Water	74.5
Sodium metasilicate (Metso Beads 2048)	2.0
Potassium pyrophosphate	2.0
Dowanol PnB glycol ether	5.0
Witconate 1250 emulsifier	3.0
Sodium xylene sulfonate (40%)	7.0
Plurafac D-25 surfactant	4.0
Plurafac RA-40 surfactant	2.5

Notes: Combine first three components and stir to dissolve solids. Add remaining components in order listed. Cleaner should be clear and slightly yellow.

SOURCE: The Dow Chemical Co.: Hard Surface Cleaners: Formula

All Purpose Hard Surface Cleaner

	%, Wt.
TKPP (60%)	15.0
NaOH (50%)	1.4
Monafax 1293	5.0
Monamine ALX-100S	3.0
Water	75.6

Industrial Hard Surface Cleaner-A

	%, Wt.
TKPP (60%)	10.0
Na2SiO3 (Anhydrous)	2.0
NaOH (50%)	0.9
Surfonic N95	3.0
Monafax 1293	3.0
Water	81.1

Industrial Hard Surface Cleaner-B

	%, Wt.
TKPP (60%)	12.0
Na2CO3	3.0
NaOH (50%)	1.4
Monafax 1293	5.0
Water	78.6

SOURCE: Mona Industries, Inc.: MONAFAX 1293: Formulas

Hard Surface Cleaners-All Purpose

All Purpose Liquid Concentrate

	%w
Neodol 23-6.5	5.0
Neodol 25-3	2.5
Butyl Oxitol glycol ether (a)	6.0
Pine oil	0.25
Tetrapotassium pyrophosphate	3.0
Sodium metasilicate, pentahydrate	2.0
Sodium xylene sulfonate (40%)	1.0
Water, dye, perfume	to 100%

Properties:

Viscosity, 73F, cps: 5
Phase coalescence temp., F: 104
pH: 13

Use Concentration:

2-4 oz./gal.

All Purpose Spray-High Quality

	%w
Neodol 91-6	3.0
Butyl Oxitol glycol ether (a)	3.0
Sodium tripolyphosphate	2.0
Sodium metasilicate, pentahydrate	2.0
EDTA (b)	0.5
Sodium xylene sulfonate (40%)	4.0
Water, dye, perfume	to 100%

Properties:

Viscosity, 73F, cps: 5
Phase coalescence temp., F: 142
pH: 13

All Purpose Spray-Good Quality

	%w
Neodol 23-6.5 or Neodol 25-3S (60%)	1.7
Cocodiethanolamide (c)	0.5
Trisodium phosphate, anhydrous basis	1.0
Sodium metasilicate, pentahydrate	1.7
Butyl Oxitol Glycol Ether (a)	3.5
Water, dye, perfume	to 100%

Properties:

Viscosity, 73F, cps: 7
Phase coalescence temp., F: 140
pH: 12.4

Blending Procedure:

Dissolve phosphate and silicate in warm water. Add EDTA, Neodol 91-6, sodium xylene sulfonate and Butyl Oxitol with agitation until homogeneous.

(a) Shell Chemical Co.
(b) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis. Can be replaced with nitrilotriacetic acid, trisodium salt or sodium citrate, must increase sodium xylene sulfonate to 10% for good temperature stability.
(c) Such as Witcamide M-3, Witco Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Hard Surface Cleaners-All Purpose
Creamy Scouring Cleanser
Soft Abrasive Type: High Quality

	%w
Neodol 23-6.5	9.0
FADEA (b)	1.0
Calcium carbonate (100 mesh) (c)	40.0
Colloidal thickener (d)	1.2
Organic gum (e)	0.4
Preservatives	0.1
Water, dye, perfume	to 100%

Soft Abrasive Type: Good Quality

	%w
Neodol 91-6 (a)	6.3
Neodol 91-2.5 (a)	2.7
FADEA (b)	1.0
Calcium carbonate (100 mesh) (c)	40.0
Colloidal thickener (d)	1.2
Organic gum (e)	0.4
Preservatives	0.1
Water, dye, perfume	to 100%

Blending Procedure:

Blend thickener and organic gum and add to water slowly with vigorous mixing until smooth. Add calcium carbonate slowly and mix. Add Neodol alcohol ethoxylate(s) and amide slowly and mix until smooth and uniform. The final product is lotion-like. Can be made more fluid by diluting with water.

(a) For household use, replace with Neodol 23-6.5.
(b) Fatty acid diethanolamide, Ninol 49 CE, Stepan Co., or equivalent product.
(c) May substitute with Kaopolite, Georgia Kaolin, or equivalent product.
(d) Veegum, R.T. Vanderbilt Co., or equivalent product.
(e) Kelzan (xanthan gum), Kelco Div., or equivalent product.

Leather, Vinyl and Plastic Cleaner

	%w
Neodol 91-6	10.0
Butyl Oxitol glycol ether (a)	6.0
Amyl acetate	1.0
Isopropyl alcohol	2.5
Water, dye, perfume	to 100%

Properties:

Viscosity, 73F, cps: 8
Phase coalescence temp., F: 119
pH: 5.2

SOURCE: Shell Chemical Co.: Neodol Starting Formulations for Cleaning Products: Formulas

Hard Surface Cleaner-All Purpose
D-Limonene Cleaner-High Quality Concentrate

	%w
D-Limonene	50.0
Neodol 25-3S (60%)	24.0
Neodol 25-3	10.0
Neodol 25-7	6.0
FADEA (a)	10.0

Properties:
Viscosity, 73F, cps: 15
Phase coalescence temp., F: >165

D-Limonene Cleaner: Degreaser Non-Phosphate

	%w
D-Limonene	20.0
Neodol 91-8	5.0
C12LAS (60%) (b)	7.6
FADEA (a)	10.0
Isopropyl alcohol	10.0
Deionized water, dye	to 100%

Properties:
Viscosity, 73F, cps: 22
Phase coalescence temp., F: >165
pH: 10.5

D-Limonene Cleaner: Degreaser with Phosphate

	%w
D-Limonene	10.0
Neodol 91-8	5.0
C12LAS (60%) (b)	21.2
FADEA (a)	5.0
Tetrapotassium pyrophosphate	2.0
Isopropyl alcohol	5.0
Deionized water, dye	to 100%

Properties:
Viscosity, 73F, cps: 31
Phase coalescence temp., F: >165
pH: 10.8

Blending Procedure: Simple mixing
Recommended Dilutions:
Heavy-duty use: 8 oz./gal. (1/16).
Regular-duty use: 4 oz./gal. (1/32).
Light-duty use: 2 oz./gal. (1/64).

(a) Fatty acid diethanol amide such as Ninol 49 CE, Stepan Co., or equivalent product.
(b) Witconate 1260, Witco Corp., or Bio-Soft D-62, Stepan Co., or equivalent product may be used.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Hard Surface Cleaners-All Purpose
Economy with Phosphate

	%w
Neodol 91-6 (a)	1.8
Neodol 91-2.5 (a)	0.8
Sodium metasilicate, pentahydrate	5.6
Trisodium phosphate, anhydrous basis	1.6
Sodium carbonate	3.0
Phosphate ester (b)	6.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 10
Phase coalescence temp., F: 160
pH: 13.2

Economy Non-Phosphate

	%w
Neodol 91-6 (a)	1.8
Neodol 91-2.5 (a)	0.8
Sodium metasilicate, pentahydrate	5.6
EDTA (c)	1.6
Sodium carbonate	3.0
Sodium xylene sulfonate (40%)	10.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 8
Phase coalescence temp., F: 140
pH: 13.4

Blending Procedure:
Dissolve the surfactant and hydrotrope in water. Add the builders with stirring at a rate to promote solution. For long term stability reasons the formulated concentrates should not be stored in glass containers.

Recommended Dilutions:
Heavy-duty use: 12.8 oz./gal. (1/10).
Regular-duty use: 8 oz./gal. (1/16).
Light-duty use: 4 oz./gal. (1/32).

(a) May substitute with Neodol 23-6.5.
(b) Triton H-66, Union Carbide Corp., or equivalent product. May substitute with 10% sodium xylene sulfonate (40%).
(c) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis)

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Hard Surface Cleaners-All Purpose

Pine Oil Cleaner-High Quality

	%w
Pine oil	20.0
Neodol 91-8	4.7
C12LAS (60%) (a)	7.8
Isopropyl alcohol	11.0
Triethanolamine	4.7
Water, dye	to 100%

Properties:

Viscosity, 73F, cps: 16
Phase coalescence temp., F: >158
pH: 10.7
Cloudiness on mixing with water: very high

Pine Oil Cleaner-Good Quality

	%w
Pine oil	10.0
Neodol 91-8	4.7
C12LAS (60%) (a)	7.8
Isopropyl alcohol	8.0
Triethanolamine	2.0
Water, dye	to 100%

Properties:

Viscosity, 73F, cps: 15
Phase coalescence temp., F: >158
pH: 10.3
Cloudiness on mixing with water: high to average

Blending Procedure:

Simple mixing. If using Neodol 25-3S, add it last, slowly with good stirring.

(a) Witconate 1260, Witco Corp., or equivalent product. May substitute with equal amounts of Neodol 25-3S (60%) plus 4.6% (for the high quality formula) or 2.0% (for the good quality formula) sodium xylene sulfonate (40%).

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Hard Surface Cleaners-All Purpose
Ready-To-Use Liquid

	%w
Neodol 23-6.5	4.8
C12LAS (60%) (a)	3.3
Sodium carbonate	4.0
EDTA (b)	6.0
Sodium xylene sulfonate (40%)	6.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 23
- Phase coalescence temp., F: >176
- pH: 11.3

Use Concentration:
- 2 oz./gal.

(a) Such as Witconate 1260, Witco Corp., or equivalent product
(b) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis). Can be replaced with nitrilotriacetic acid, trisodium salt or sodium citrate. If replaced with sodium citrate, must increase sodium xylene sulfonate to 10% for good temperature stability.

Spray and Wipe Liquid

	%w
Neodol 25-12	2.0
Neodol 25-3S (60%)	1.0
Butyl Oxitol glycol ether (a)	3.0
Tetrapotassium pyrophosphate	2.0
EDTA (b)	0.5
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 2
- Phase coalescence temp., F: >165
- pH: 10.5

(a) Shell Chemical Co.
(b) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis). Can be replaced with nitrilotriacetic acid, trisodium salt or sodium citrate. May need to adjust stability by addition of sodium xylene sulfonate (40%)

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulations

Hard Surface Cleaner Concentrate (Liquid)

Soil: Food grease, oil and protein, petroleum grease and oil
Surface: Metal, ceramic, polymeric, glass
Application Method: Wipe, mop or spray (diluted)
Manufacture: Mix tank with propeller stirrer

Composition A:	% Wt
Water	71.4
TSP	1.6
Starso	14.0
Sodium Hydroxide (50%)	4.0
*Phosphate Ester	5.0
**C9-C11 Linear Alcohol, 6 Moles EO	2.8
**C9-C11 Linear Alcohol, 2.5 Moles EO	1.2

Composition B:	% Wt
Water	65.4
TSP	1.6
Starso	18.0
Sodium Hydroxide (50%)	5.0
*Phosphate Ester	6.0
**C9-C11 Linear Alcohol, 6 Moles EO	2.8
**C9-C11 Linear Alcohol, 2.5 Moles EO	1.2

Use Dilution: 3-6% bw (4-8 oz/gallon)

* Mona Industries, Rohm & Haas
** Shell, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Hard Surface Cleaner

Formulation:	Wt.%
Water	75.25
Sodium metasilicate (Metso Beads 2048)	2.00
Potassium pyrophosphate	2.00
Dowanol PnB glycol ether	6.00
Sodium xylene sulfonate (40%)	9.00
Neodol 25-7 ethoxylate	3.00
Neodol 25-3 ethoxylate	2.50
Unipine 85 pine oil	0.25

Note: All purpose liquid concentrate hard surface cleaner. Combine first three components and stir to dissolve solids. In a separate container mix the remaining components and add the initial mixture. Cleaner may be slightly cloudy.

SOURCE: The Dow Chemical Co.: Formula No. 25

Hard Surface Cleaner Concentrate (Liquid)

Soil: Food, grease, oil and protein, petroleum grease and oil
Surface: Metal, ceramic, polymeric, glass
Application Method: Wipe, mop or spray (diluted)
Manufacture: Mix tank with propeller stirrer

Composition A:	% Wt
Water	28.0
N Clear	10.0
Sodium Hydroxide (50%)	5.0
EDTA, Tetrasodium (37%)	20.0
*Sodium Xylene Sulfonate (40%)	30.0
**C12-C13 Linear Alcohol, 6.5 Moles EO	7.0

Composition B:	% Wt
Water	18.5
N Clear	15.0
Sodium Hydroxide (50%)	7.5
EDTA, Tetrasodium (37%)	20.0
*Sodium Xylene Sulfonate (40%)	32.0
**C12-C13 Linear Alcohol, 6.5 Moles EO	7.0

Use Dilution: 3-6% bw (4-8 oz/gallon)

* Witco, Stepan
** Shell, Union Carbide, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Hard Surface Cleaner

Formulation:	Wt.%
Water	83.0
Sodium metasilicate (Metso Beads 2048)	2.0
Potassium pyrophosphate	2.0
Dowanol PnB glycol ether	4.0
Tergitol 15-S-5 intermediate	2.0
Sodium xylene sulfonate (40%)	7.0

Note: Combine first three components and stir to dissolve solids. Add rest of components in order listed. Cleaner should be clear and slightly yellow in color,

SOURCE: The Dow Chemical Co.: Formula No. 27

Hard Surface and Floor Cleaner

Ingredients:	% by Wt.
Water	72.0
Stepanate SXS	3.0
Sodium tripolyphosphate	8.0
Tetrapotassium pyrophosphate	8.0
Ninol 1285	9.0

Mixing Procedure:
Blend in the order shown above.

Properties:
Appearance: Light, yellow liquid
pH, as is: 10.5
Active, %: 26.2
Viscosity @ 25C, cps: 150

Use Instructions:
Dilute 1 to 4 ozs in one gallon of water.

Comment:
Formulation shows good builder tolerance
Can be used in manual or automatic scrub machines
Formulation No. 52

Hard Surface and Floor Cleaner

Ingredients:	% by Wt.
Water	73.0
Sodium tripolyphosphate	6.0
Trisodium phosphate	6.0
Sodium metasilicate, anhyd.	3.0
Stepanate SXS	3.0
Ninol 1285	9.0

Mixing Procedure:
Blend ingredients in order given above.

Properties:
Appearance: Light yellow liquid
Active, %: 25.2
Viscosity @ 25C, cps: 150
pH, as is: 11.8

Use Instructions:
Dilute 1 to 4 ozs in one gallon of water.

Comment:
Formulation shows good builder tolerance
Can be used in manual or automatic scrub machines

SOURCE: Stepan Co.: Formulation No. 54

Hard Surface and Floor Cleaner

Ingredients:	% by Wt.
Tetrapotassium pyrophosphate	20.0
Ninol 5024	8.0
Stepanate SXS	2.0
Water, D.I.	70.0

Mixing Procedure:
Add ingredients to water in order given.

Properties:
Appearance: Clear liquid
Viscosity @ 25C, cps: 100
pH, as is: 10.5
Solids, %: 28.8

Use Instructions:
This concentrate can be used at a dilution of 1-4 oz/gal.

Comment:
Ninol 5024 coupled with Stepanate SXS shows good builder tolerance. An excellent formulation for use in manual or completely automated scrub machines because of moderate, fast-breaking foam which does not interfere with machine operation.
Formulation No. 430

Hard Surface and Floor Cleaner

Ingredients:	% by Wt.
Trisodium phosphate	5.0
Sodium tripolyphosphate	5.0
Ninol 5024	8.0
Water, D.I.	82.0

Mixing Procedure:
Add builders to the water, then add Ninol 5024.

Properties:
Appearance: Clear liquid
Viscosity @ 25C, cps: 175
pH, as is: 12.3
Solids, %: 18

Use Instructions:
This concentrate can be used at a dilution of 1-4 oz/gal.

Comment:
Ninol 5024 shows good builder tolerance. This is an excellent formulation for use in manual or completely automated scrub machines due to the moderate, fast-braking foam which does not interfere with machine operation.

SOURCE: Stepan Co.: Formulation No. 431

Hard Surface Cleaners
Liquid Concentrate

Ingredient:	Wt.%
NTA (1)	10.0
Sodium Alkylbenzene Sulfonate (LAS)	4.0
Alkylphenol Ethoxylate	2.0
Ethylene Glycol Monobutyl Ether	0.5
Sodium Xylene Sulfonate	As Necessary
Water	Balance

(1) Monsanto Co., Code 000

Spray Type

Ingredient:	Wt.%
NTA (1)	2.5
Sodium Alkylbenzene Sulfonate (LAS)	1.0
Alkylphenol Ethoxylate	0.5
Ethylene Glycol Monobutyl Ether	2.4
Sodium Xylene Sulfonate	As Necessary
Water	Balance

(1) Monsanto Co., Code 000

Hard Surface & Floor Cleaner

Ingredient:	Wt.%
Stepanate X	5.0
Sodium Metasilicate, Anhydrous	3.0
NTA (1)	2.5
Ninol 11-CM	8.0
Water, Dye, Perfume	81.5

(1) Monsanto Co., Code 000

SOURCE: Monsanto Co.: NTA: Properties and I&I Applications: Formulas

Hard Surface Cleaners-All Purpose

Hard Surface Cleaner Liquid Concentrate-High Quality with Phosphate

	%w
Neodol 91-6	2.0
Neodol 91-2.5	2.0
Sodium metasilicate, pentahydrate	8.3
Trisodium phosphate, anhydrous basis	3.2
Phosphate ester (a)	7.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 8
- Phase coalescence temp., F: 150
- pH: 13.2

Hard Surface Cleaner Liquid Concentrate-High Quality Non-Phosphate

	%w
Neodol 91-6	2.0
Neodol 91-2.5	2.0
Sodium metasilicate, pentahydrate	8.3
NTA (b)	3.2
Alkyl napthalene sulfonate (c)	7.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 8
- Phase coalescence temp., F: 135
- pH: 13.2

Blending Procedure:

Dissolve the surfactant and hydrotrope in water. Add the builders with stirring at a rate to promote solution. For long term stability reasons the formulated concentrates should not be stored in glass containers.

Recommended Dilutions:
- Heavy-duty use: 12.8 oz./gal. (1/10).
- Regular-duty use: 8 oz./gal. (1/16).
- Light-duty use: 4 oz./gal. (1/32).

(a) Triton H-66, Union Carbide Corp., or equivalent product. May substitute with 12% sodium xylene sulfonate (40%).
(b) Nitrilotriacetic acid, trisodium salt. May substitute with ethylenediamine tetraacetic (EDTA).
(c) Petro BA (95%), Witco Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Clening Products: Formulations

Hard Surface Cleaners--All Purpose
Hard Surface Cleaner Liquid Concentrate: Regular Quality With Phosphate

	%w
Neodol 91-6	2.8
Neodol 91-2.5	1.2
Sodium metasilicate, pentahydrate	11.1
Trisodium phosphate, anhydrous basis	1.6
Phosphate ester (a)	6.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 5
Phase coalescence temp., F: 135
pH: 13.2

Hard Surface Cleaner Liquid Concentrate: Regular Quality Non-Phosphate

	%w
Neodol 91-6	2.8
Neodol 91-2.5	1.2
Sodium metasilicate, pentahydrate	11.1
NTA (b)	1.6
Sodium xylene sulfonate (40%)	10.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 8
Phase coalescence temp., F: 135
pH: 13.2

Blending Procedure:
Dissolve the surfactant and hydrotrope in water. Add the builders with stirring at a rate to promote solution. For long term stability reasons the formulated concentrates should not be stored in glass containers.

Recommended Dilutions:
Heavy-duty use: 12.8 oz./gal. (1/10)
Regular-duty use: 8 oz./gal. (1/16).
Light-duty use: 4 oz./gal. (1/32).

(a) Triton H-66, Union Carbide Corp., or equivalent product. May substitute with 12% sodium xylene sulfonate (40%).
(b) Nitrilotriacetic acid, trisodium salt. May substitute with ethylene-diamine tetraacetic acid (EDTA).

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulations

Hard Surface Cleaners--All Purpose
Non-Phosphate Premium Quality Liquid Concentrate-For Hard Water

	%w
Neodol 91-6	7.0
Sodium metasilicate, pentahydrate	14.6
EDTA (a)	12.6
Dicarboxylic organic acid (b)	8.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 13
Phase coalescence temp, F: 158
pH: 13.3

Recommended Dilutions:
Heavy-duty use: 4 oz./gal.
Regular-duty use: 2 oz./gal.

Non-Phosphate Premium Quality Liquid Concentrate
For Medium-Hardness Water

	%w
Neodol 91-6	8.0
Sodium metasilicate, pentahydrate	11.1
EDTA (a)	9.6
Dicarboxylic organic acid (b)	8.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 6
Phase coalescence temp., F: >165
pH: 12.5

Recommended Dilutions:
Heavy-duty use: 4 oz./gal.
Regular-duty use: 2 oz./gal.

Blending Procedure:
Dissolve the surfactant and hydrotrope in water. Add the builders with stirring at a rate to promote solution. For long term stability reasons the formulated concentrates should not be stored in glass containers.

(a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis)
(b) Westvaco Diacid 1595, Westvaco Co., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Hard Surface Cleaners-All Purpose
Non-Phosphate Premium Quality Liquid Concentrate-For Heavy Oil Removal

	%w
Neodol 91-6	3.0
Neodol 91-2.5	3.0
Sodium metasilicate, pentahydrate	12.5
NTA (c)	4.8
Sodium xylene sulfonate (40%)	15.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 13
Phase coalescence temp, F: 165
pH: 13.2

Recommended Dilutions:
Heavy-duty use: 12.8 oz./gal. (1/10).
Regular-duty use: 4 oz./gal. (1/32).
Light-duty use: 2 oz./gal. (1/64).

Non-Phosphate Premium Quality Liquid Concentrate: Lower pH

	%w
Neodol 1-5	4.0
Neodol 25-3S (60%)	1.7
EDTA (a)	3.5
Sodium sesquicarbonate	1.5
Butyl Oxitol glycol ether (d)	5.0
Sodium xylene sulfonate (40%)	5.0
Water, dye, perfume	to 100%

Properties:
Phase coalescence temp., F: 160
pH: 10.3

Blending Procedure:
Dissolve the surfactant and hydrotrope in water. Add the builders with stirring at a rate to promote solution. For long term stability reasons the formulated concentrates should not be stored in glass containers.

(a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
(c) Nitrilotriacetic acid, trisodium salt. May replace with EDTA.
(d) Shell Chemical Co.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Hard Surface Spray Cleaner (Liquid)

Soil: Food grease, oil and protein, petroleum grease and oil
Surface: Metal, ceramic, polymeric, glass
Application Method: Spray and wipe
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	90.00
TKPP	2.00
N Clear	1.88
Sodium Hydroxide (50%)	0.12
*Dipropylene Glycol Monomethyl Ether	5.00
**Octylphenoxy Polyethoxyethanol, 12-13 Moles EO	1.00

Use: As is, spray

* Dow, Arco Chemical
** Rohm & Haas, GAF

Spray and Wipe Household Hard Surface (Liquid)

Soil: Food grease, oil and protein, petroleum grease and oil
Surface: Metal, ceramic, polymeric, glass
Application Method: Spray and wipe
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	88.2
Metso Beads 2048	2.4
STPP	2.0
EDTA, tetrasodium (37%)	1.4
*Ethylene Glycol n-Butyl Ether	3.0
**C9-C11 Linear Alcohol, 6 Moles EO	3.0

Use Dilution: As is

* Dow, Union Carbide
** Shell, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Moderate Foaming Hard Surface Cleaner-A

Component:	% by Weight
Water	68
Burcosolv TM	5
Burcowet TMW	20
Burco TME	7

Moderate Foaming Hard Surface Cleaner-B

Component:	% by Weight
Water	60
TEA-85	3
Burcosperse AP Liquid	3
NTA-150	2
Burcosolv TM	5
Burcowet TMW	20
Burco TME	7

Formulation B has greater hard water compatability and anti-redeposition characteristics. Both formulations provide excellent hard surface wetting and detergency.

High Foaming Hard Surface Cleaner-A

Components:	% by Weight
Water	63
Burcosolv TM	5
Burco TME	7
Burco TM-HF	25

High Foaming Hard Surface Cleaner-B

Components:	% by Weight
Water	55
TEA-85	3
Burcosperse AP Liquid	3
NTA-150	2
Burcosolv TM	5
Burco TME	7
Burco TM-HF	25

Formulation B has greater hard water compatability and anti-redeposition characteristics. These formulations produce thick, copious foams that are suitable for foam on applications. They provide excellent hard surface detergency and emulsification.

SOURCE: Burlington Chemical Co., Inc.: Formulas

8. Laundry Products

Aerosol Detergent/Disinfectant

Ingredients:	%w
Water	85.66
BTC 2125M (50% Active) EPA Reg. No. 1839-46	0.40
EDTA (38%)	4.00
Neutronyx 656	0.50
Sodium metasilicate pentahydrate	0.25
Ethylene glycol monobutyl ether	2.00
Diethylene glycol monoethyl ether	2.00
Fragrances: Pine Needles SYN802277U (Polak Frutal Works)	0.19
Isobutane Propellant	5.00

Mixing Procedure:

For liquid phase, charge vessel with water and add remaining ingredients in order shown. Then follow standard aerosol manufacturing procedures.

Properties of Liquid Phase Only:

Appearance: Clear, colorless liquid
pH, as is: 11.7
Density, lbs/gal: 8.0
Viscosity @ 25C: Water thin

Use Instructions:

Disinfectation, Deodorization and Cleaning:

Hold 6 to 8 ins. from surface to be treated. Spray area until covered with foam. Allow foam to penetrate the surface and remain wet for 10 mins.

Mildewstat:

Spray surface to be treated making sure to wet completely.
For complete use instructions, see EPA registered label.

Storage Stability:

This formulation is freeze/thaw stable. It will return to its original state upon thawing.

Formulation is stable at 120F for 30 days.

Comments:

This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.

EPA Registration No. 1839-84

Source: Stepan Co.: Formulation No. 38

Aerosol Starch

Formulation E2-7245 provides excellent lubricity between the treated fabric and the heated sole plate of an iron. The silicone ingredient in this product reduces or eliminates the problem of doughnut-shaped, open-center spray patterns and allows for dispensing in a uniform spray pattern.

Aerosol Concentrate:

Part:	Ingredients:	Percent by Weight
A	Starch #5541	3.60
	Water	85.76
B	Methyl Parasept	0.14
	Borax	0.14
C	*Dow Corning HV-490 Emulsion	1.00

* Dow Corning 37 Emulsion may be substituted for Dow Corning HV-490 Emulsion.

Suggested Aerosol Formulation:

Ingredients:	Percent by Weight
Concentrate E2-7245	80
Propellant of choice	20

Preparation:

1. Mix Part A, heat and stir for 15 to 20 minutes just under boiling.
2. While Part A is cooling, add Part B at about 120F (49C).
3. Add Part C with agitation.
   Formulation E2-7245

Aerosol Fabric Size

Formulation E2-7246 is an aerosol fabric size that, when repeatedly used, conditions the sole plate of the iron. This silicone conditioning makes ironing easier on all fabrics (even unsized) and inhibits size build-up and charring.

Aerosol Concentrate:

Ingredients:	Percent by Weight
Dow Corning HV-490 Emulsion	0.40
CMC-7L2	1.50
Borax	0.15
Sandoz AS Optical Brightener	0.05
Morpholine	0.10
Water	97.80

Suggested Aerosol Formulation:

Ingredients:	Percent by Weight
Concentrate E2-7246	95.0
Isobutane	5.0

Source: Dow Corning Corp.: Formulation E2-7246

Aerosol-Type Prespotters-Solvent-Based

Premium Quality

	%w
Neodol 25-7	15.0
Neodol 25-3	15.0
Shell Sol 71 or 72 (e)	64.0
Ethanol	4.0
Water (a)	2.0

High Quality(b)

	%w
Neodol 45-2.25	10.0
Shell Sol 71 or 72 (e)	90.0

High Quality(c)

	%w
Neodol 25-7	5.0
Neodol 25-3	5.0
Shell Sol 71 or 72 (e)	89.0
Water (a, d)	1.0

Blending Procedure:
Add water last, mix vigorously.

(a) To avoid corrosion, a lined can may be needed.
(b) Designed for heavy greasy soils.
(c) For general stains.
(d) For an anhydrous product, use 85% Shell Sol 71 or 72 and 5% ethanol.
(e) Isoparaffinic solvent, b.p. 356-401F, Shell Chemical Co.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Alkaline Metal Cleaner

Raw Materials:	% by Weight
Surfonic L12-6	10.0
Sodium metasilicate, pentahydrate	7.0
Trisodium phosphate, anhydrous basis	2.0
Sodium hydroxide (50%)	3.0
EDTA	6.0
Phosphate Ester Coupling Agent**	5.0
Water	to 100%

**e.g. Triton H-66

Alkaline Metal Cleaner

Raw Materials:	% by Weight
Surfonic L12-6	7.5
Sodium metasilicate, pentahydrate	15.6
EDTA	1.0
Phosphate Ester Coupling Agent**	8.0
Water	to 100%

**e.g. Triton H-66

Blending procedure: Add builders last with vigorous mixing until homogeneous.

Recommended dilution: 1-2 oz. concentrate/gallon water

Caustic-Gluconate Soak Formulation

Raw Materials:	% by Weight
Sodium Hydroxide	55-9
Sodium Gluconate	10-3
Surfonic N-95	1-3
C12 LAS	2-8

Concentrattion: 8-48 oz./gal.
Temperature: 140F to boiling
For electrolytic derusting, omit the wetting agent.

Alkaline Soak Tank Cleaner for Brass

Raw Materials:	% by Weight
Trisodium Phosphate	50
Sodium Metasilicate, pentahydrate	30
Sodium Carbonate (soda ash)	13
Surfonic N-95	7

Concentration: 4-12 oz./gal.
Temperature: 175-200F

SOURCE: Texaco Chemical Co.: Formulas

Built-Liquid Detergent Formulations

The following formulations exemplify the products which can be prepared with Triton Hydrotropes. All formulations are shown on an "as-supplied" basis.

Triton X-100 solubilized in concentrated TKPP solution.

Ingredients:	Wt Percent
Triton X-100	5
Triton H-55	14
TKPP	40
Water	41

Clear from 10 to 50C

Typical anionic surfactant solubilized in concentrated TKPP solution.

Ingredients:	Wt Percent
Linear Alkylbenzenesulfonate, active	5
Triton H-55	15
TKPP	35
Water	45

Clear from 10 to 50C

Triton X-100 solubilized in a highly alkaline, highly concentrated system:

Ingredients:	Wt Percent
Triton X-100	2
Triton H-55	6
Potassium Hydroxide	12
Sodium Metasilicate, anhydrous	12
TKPP	12
Water	56

Clear from 0 to 46C

Triton X-100 solubilized in a highly concentrated, highly alkaline system.

Ingredients:	Wt Percent
Triton X-100	0.5
Triton H-66	1.5
Sodium Hydroxide	20.0
Water	78.0

Clear from 0C to the boil

SOURCE: Union Carbide Chemicals and Plastics Co. , Inc.: TRITON H-55, H-66, and QS-44: Formulas

Detergent/Softener

Ingredients:	% by Wt.
Water, D.I.	73.0
Accosoft 750	7.0
Makon 10	20.0

Mixing Procedure:
Charge water and add Makon 10 while mixing. Slowly add Accosoft 750 while mixing and mix until homogeneous.

Properties:
Appearance @ 25C: Clear liquid
pH, as is: 5.8
Viscosity @ 25C, cps: 910
Visc @ 50C 2 weeks, cps: 867
Visc after freeze/thaw, cps: 570
Solids, %: 26.3
Density, lbs/gal: 8.49

Use Instructions:
Use 1/2 cup in wash cycle per normal wash load.

Comment:
The viscosity of this formulation can be reduced by the addition of ethanol if desired. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 336

Detergent/Softener

Ingredients:	% by Wt.
Water, D.I.	70.0
Accosoft 750	7.0
Makon 10	20.0
Triethanolamine	3.0

Mixing Procedure:
Charge water and add Makon 10 while mixing. Slowly add Accosoft 750 while mixing. Finally, TEA and mix until homogeneous.

Properties:
Appearance @ 25C: Clear liquid
pH, as is: 9.3
Viscosity @ 25C, cps: 675
Visc @ 50C 1 week, cps: 500
Visc after freeze/thaw, cps: 570
Solids, %: 29.3
Density, lbs/gal: 8.53

Use Instructions:
Use 1/2 cup in wash cycle per normal wash load.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 375

Detergent/Softener

Ingredients:	% By Wt.
Water, D.I.	70.0
Accosoft 540	7.0
Makon 10	20.0
Triethanolamine	3.0

Mixing Procedure:
Charge water and add Makon 10 while mixing. Heat Accosoft 540 to approximately 100F to melt. Slowly add Accosoft 540 while mixing. Finally, add TEA and mix until homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 9.5
Viscosity @ 25C, cps: 500
Visc @ 50C 4 weeks, cps: 1640
Visc after freeze/thaw, cps: 1220
Solids, %: 29.2
Density, lbs/gal: 8.53

Use Instructions:
Use 1/2 cup in wash cycle per normal wash load.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 449

Detergent/Softener

Ingredients:	% by Wt.
Water, D.I.	70.0
Accosoft 580	7.0
Makon 10	20.0
Triethanolamine (85%)	3.0

Mixing Procedure:
Charge water and add Makon 10 while mixing. Heat Accosoft 580 to approximately 100F to melt. Slowly add Accosoft 580 while mixing. Finally, add TEA and mix until homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 9.5
Viscosity @ 25C, cps: 355
Visc @ 50C 4 weeks, cps: 3200
Visc after freeze/thaw, cps: 482
Solids, %: 29.0
Density, lbs/gal: 8.53

Use Instructions:
Use 1/2 cup in wash cycle per normal wash load.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 450

Detergent/Softener

Ingredients:	% by Wt.
Water, D.I.	70.0
Accosoft 550L-90	7.0
Makon 10	20.0
Triethanolamine (85%)	3.0

Mixing Procedure:
Charge water and add Makon while mixing. Slowly add Accosoft 550L-90 while mixing. Finally, add TEA and mix until homogeneous.

Properties:
Appearance @ 25C: Translucent liquid
pH, as is: 9.3
Viscosity @ 25C, cps: 800
Visc after freeze/thaw, cps: 920
Solids, %: 29.2
Density, lbs/gal: 8.53

Use Instructions:
Use 1/2 cup in wash cycle per normal wash load.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 459

High Foaming Detergent/Softener

Ingredients:	% by Wt.
Water, D.I.	73.0
Accosoft 750	7.0
Makon 10	18.0
Ammonyx LO	5.0

Mixing Procedure:
Charge water and add Makon 10 while mixing. Slowly add Accosoft 750 while mixing. Finally add the Ammonyx LO and mix until homogeneous.

Properties:
Appearance @ 25C: Clear liquid
pH, as is: 6.7
Viscosity @ 25C, cps: 595
Visc @ 50C 1 week, cps: 580
Visc after freeze/thaw, cps: 500
Solids, %: 25.8
Density, lbs/gal: 8.46

Use Instructions:
Use 1/2 cup in wash cycle per normal wash load or a small amount in cold water for fine fabrics.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 500

Detergent-Softener (1/4 Cup Formulation)

Raw Materials:	% by Weight
Surfonic N-85	23.3
Softener: Adogen 470-75%	8.0
Triethanolamine	2.3
Optical Brightener: Tinopal CBS-X	0.35
Dye and Fragrance	As desired
Ethanol	As needed
Water	to 100%

Active, wt%: 32.4

Detergent-Softener (1/4 Cup Formulation)

Raw Materials:	% by Weight
Surfonic N-85	25.6
Softener: Armosoft WA-104	7.8
Anionic Surfactant	7.8
Optical Brightener	As desired
Dye and Fragrance	As desired
Ethanol	8.0
Water	to 100%

Active, wt%: 35.0

Detergent-Softener (1/4 Cup Formulation)

Raw Materials:	% by Weight
Surfonic N-85	30.0
Softener: Varisoft 222LT-90%	6.7
Optical Brightener: Tinopal RBS-200%	0.35
Dye and Fragrance	As desired
Ethanol	As needed
Water	to 100%

Active, wt%: 36.0

SOURCE: Texaco Chemical Co.: Formulas

Detergent-Softener (1/2 Cup Formulation)

Raw Materials:	% by Weight
Surfonic HDL	20.5
Softener: Armosoft WA-104	6.2
Anionic Surfactant	6.2
Optical Brightener	As desired
Dye and Fragrance	As desired
Ethanol	9.0
Water	to 100%

Active, wt %: 28.0

Detergent-Softener (1/2 Cup Formulation)

Raw Materials:	% by Weight
Surfonic HDL	18.2
Softener: Varisoft 3690-75%	4.7
Sodium Citrate Dihydrate	0.45
Optical Brightener: Tinopal CBS-X	0.15
Dye and Fragrance	As desired
Ethanol	As needed
Water	to 100%

Detergent-Softener (1/2 Cup Formulation)

Raw Materials:	% by Weight
Surfonic N-85	18.1
Softener: Varisoft 22LT-90%	3.9
Sodium Citrate Dihydrate	0.45
Optical Brightener: Tinopal CBS-X	0.15
Dye and Fragrance	As desired
Ethanol	As needed
Water	to 100%

Active, wt%: 21.6

SOURCE: Texaco Chemical Co.: Formulas

Dry-Blended Compact Laundry Powders Containing Phosphate
High Density-One-Quarter Cup
High Quality

	%w
Neodol 23-6.5 (a)	13.0
Neodol 23-3 (a)	7.0
Sodium tripolyphosphate (b)	73.0
Sodium silicate (c)	5.0
Antiredeposition agent (d)	2.0
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Good Quality

	%w
Neodol 23-6.5 (a)	13.0
Neodol 23-3 (a)	7.0
Sodium tripolyphosphate (b)	58.4
Sodium carbonate (f)	14.6
Sodium silicate (c)	5.0
Antiredeposition agent (d)	2.0
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Dry Blending Procedure:
The dry blending procedure that gives the best results in the laboratory with the nonionic surfactant-based high density laundry powders is the following:

1. Combine all dry components over a 1-2 minute time period while stirring in a Brabender Visco-Corder viscosimeter/paddle mixer.
2. Heat Neodol until single-phase liquid; drop-wise, add warm nonionic to dry component mixture, stirring until nonionic is evenly adsorbed onto dry component beads.

Note:
If desired, enzymes (e.g., 0.75%w) can be included in these formulas. Protease and/or amylase enzymes made by Novo Industries, IBIS, Miles Laboratories, or any other equivalent source can be used. Enzymes should be added after the surfactant is adsorbed.

(a) The combination of Neodol 23-6.5 and Neodol 23-3 may be replaced with Neodol 23-5.
(b) Light density STPP, available from either FMC Corp. or Monsanto, or equivalent product may be used.
(c) Sodium silicate G or Britesil H2O, PQ Corp., or equivalent product may be used.
(d) Carboxymethylcellulose or sodium polyacrylate (PA, Goodrite K-7058N, BF Goodrich) may be used interchangeably.
(e) A fluorescent whitening agent should also be included (0.1-0.3%w).
(f) Light density soda ash, Snowlite JG, Neos Chemical, Tronalight, Kerr-McGee Chemical, or equivalent product may be used

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Dry-Blended Compact Laundry Powders Containing Phosphate

High Density--One-Half Cup

High Quality

	%w
Neodol 25-7	10.0
Sodium tripolyphosphate (a)	68.0
Sodium carbonate (b)	16.5
Sodium silicate (c)	5.0
CMC (d)	0.5
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Good Quality

	%w
Neodol 25-7	10.0
Sodium tripolyphosphate (a)	50.0
Sodium carbonate (b)	22.5
Sodium silicate (c)	5.0
Sodium sulfate	12.0
CMC (d)	0.5
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Good Quality

	%w
Neodol 25-7	9.0
Linear alkylbenzene sulfonic acid (97%) (f)	3.1
Sodium tripolyphosphate (a)	50.0
Sodium carbonate (b)	11.5
Sodium silicate (c)	5.0
Sodium sulfate	22.0
CMC (d)	0.5
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Dry-Blended Compact Laundry Powders Containing Phosphate (Continued)
High Density--One Half Cup
Regular Quality

	%w
Neodol 25-7	10.0
Sodium tripolyphosphate (a)	34.0
Sodium carbonate (b)	23.0
Sodium silicate (c)	5.0
Sodium sulfate	27.5
CMC (d)	0.5
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Dry Blending Procedure:
The dry blending procedure that gives the best results in the laboratory with the nonionic surfactant-based high density laundry powders is the following:

1. Combine all dry components over a 1-2 minute time period while stirring in a Brabender Visco-Corder Viscosimeter/paddle mixer.
2. Heat Neodol and alkylbenzene sulfonic acid, if indicated, until single-phase liquid; add dropwise, the warm solution to the dry component mixture, stirring until the solution is evenly adsorbed onto the dry component beads.

Note:
If desired, enzymes (e.g., 0.75%w) can be included in these formulas. Protease and/or amylase enzymes made by Novo Industries, IBIS, Miles Laboratories, or any other equivalent source can be used. Enzymes should be added after the surfactant is adsorbed.

(a) Light density STPP, available from either FMC Corp. or Monsanto, or equivalent product may be used.
(b) Light density soda ash Snowlite JG, Neos Chemical, Tronalight, Kerr-McGee Chemical, or equivalent product may be used.
(c) Sodium silicate G or Britesil H2O, PQ Corp., or equivalent product may be used.
(d) Carboxymethylcellulose.
(e) A fluorescent whitening agent should also be included (0.1-0.3%w).
(f) Such as Bio-Soft S-100, Stepan Co., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Dry-Blended Compact Laundry Powders With Bleach
High Density-Three-Quarters Cup
High Quality with Phosphate

	%w
Neodol 25-7	9.0
Linear alkylbenzene sulfonic acid (97%) (a)	3.0
Sodium tripolyphosphate (b)	24.0
Sodium carbonate (c)	36.0
Sodium perborate, monohydrate	23.0
Sodium silicate (d)	4.0
CMC (e)	1.0
Fluorescent whitening agent(s) (f)	as desired

High Quality Non-Phosphate

	%w
Neodol 25-7	9.0
Linear alkylbenzene sulfonic acid (97%) (a)	3.0
Zeolite A builder (g)	39.0
Sodium carbonate (c)	21.0
Sodium perborate, monohydrate	23.0
Sodium silicate (d)	4.0
CMC (e)	1.0
Fluorescent whitening agent(s) (f)	as desired

Dry Blending Procedure:

The dry blending procedure that gives the best results in the laboratory with the nonionic surfactant-based high density laundry powders is the following:

1. Combine all dry components over a 1-2 minute time period while stirring in a Brabender Visco-Corder viscosimeter/paddle mixer.
2. Heat Neodol until single-phase liquid: drop-wise, add warm nonionic to dry component mixture, stirring until nonionic is evenly adsorbed onto dry component beads.

Note:

If desired, enzymes (e.g., 0.75%w) can be included in these formulas. Protease and/or amylase enzymes made by Novo Industries, IBIS, Miles Laboratories, or any other equivalent source can be used. Enzymes should be added after the surfactants are adsorbed.

(a) Such as Bio-Soft S-100, Stepan Co., or equivalent product.
(b) Light density STPP, available from either FMC Corp. or Monsanto, or equivalent product may be used.
(c) Light density soda ash Snowlite JG, Neos Chemical, Tronalight, Kerr-McGee Chemical, or equivalent product may be used
(d) Sodium silicate G or Britesil H2O, PQ Corp., or equivalent.
(e) Carboxymethylcellulose.
(f) A fluorescent whitening agent should also be included (0.1-0.3%w). It should be compatible with the bleach agent.
(g) Valfor 100, PQ Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Economy Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	96.7
Accosoft 440-75	3.3

Mixing Procedure

Charge water. Heat Accosoft 440-75 to approximately 130F to melt. Slowly add Accosoft 440-75 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 10
Visc after 4 weeks @ 50C, cps: 5
Visc after freeze/thaw, cps: 65
Solids, %: 2.5
Density, lbs/gal: 8.34

Use Instructions

Use 1/2 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

Formulation No. 380

Economy Fabric Softener

Ingredients:	% By Wt.
Water, D.I.	96.7
Accosoft 550 HC	3.3

Mixing Procedure:

Charge water. Slowly add Accosoft 550 HC to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 4
Visc after 4 wks @ 50C, cps: 10
Visc after freeze/thaw, cps: 20
Solids, %: 3.0
Density, lbs/gal: 8.34

Use Instructions:

Use 1/2 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 399

Economy Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	96.9
Accosoft 808	3.1

Mixing Procedure:

Charge water. Slowly add Accosoft 808 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 10
Visc after 4 weeks @ 50C, cps: 7
Visc after freeze/thaw, cps: 63
Solids, %: 2.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/2 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

Formulation No. 347

Economy Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	97.2
Accosoft 550L-90	2.8

Mixing Procedure:

Charge water. Slowly add Accosoft 550L-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 6
Visc after 4 weeks @ 50C, cps: 4
Visc after freeze/thaw, cps: 15
Solids, %: 2.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/2 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 364

Economy Fabric Softener

Ingredients:	% By Wt.
Water, D.I.	97.2
Accosoft 620-90	2.8

Mixing Procedure:

Charge water. Slowly add Accosoft 620-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 8
Visc after 4 weeks @ 50C, cps: 5
Visc after freeze/thaw, cps: 28
Solids, %: 2.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/2 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

Formulation No. 368

Economy Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	97.2
Accosoft 550-90 HHV	2.8

Mixing Procedure:

Charge water. Heat Accosoft 550-90 HHV to approximately 100F to melt. Slowly add Accosoft 550-90 HHV to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 7
Visc after 4 weeks @ 50C, cps: 7
Visc after freeze/thaw, cps: 27
Solids, %: 2.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/2 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 372

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	90.0
Accosoft 808	10.0

Mixing Procedure:

Charge water. Slowly add Accosoft 808 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 18
Visc after 2 weeks @ 50C, cps: 29
Visc after freeze/thaw, cps: 2200
Solids, %: 8.0
Density, lbs/gal: 8.34

Use Instructions:

Use 1/4 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

Formulation No. 174

Fabric Softener

Ingredients:	% By Wt.
Water, D.I.	91.1
Accosoft 620-90	8.9

Mixing Procedure:

Charge water. Slowly add Accosoft 620-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 73
Visc after 4 weeks @ 50C, cps: 64
Visc after freeze/thaw, cps: 800
Solids, %: 8.0
Density, lbs/gal: 8.34

Use Instructions:

Use 1/4 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 188

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	91.1
Accosoft 550-90 HHV	8.9

Mixing Procedure:

Charge warm water. Heat Accosoft 550-90 HHV to approximately 100F to melt. Slowly add 550-90 HHV to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 97
Visc after 4 weeks @ 50C, cps: 59
Visc after freeze/thaw, cps: 880
Solids, %: 8.0
Density, lbs/gal: 8.34

Use Instructions:

Use 1/4 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

Formulation No. 192

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	91.8
Accosoft 808	8.2

Mixing Procedure:

Charge water. Slowly add Accosoft 808 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 190
Visc after 4 weeks @ 50C, cps: 263
Visc after freeze/thaw, cps: 2080
Solids, %: 6.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/3 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 194

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	92.6
Accosoft 550L-90	7.4

Mixing Procedure:

Charge water. Slowly add Accosoft 550L-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 60
Visc after 2 wks @ 50C, cps: 127
Visc after freeze/thaw, cps: 1280
Solids, %: 6.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/3 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintan rewet properties of the fabric.

Formulation No. 195

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	92.8
Accosoft 808-90	7.2

Mixing Procedure:

Charge water. Slowly add Accosoft 808-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 64
Visc after 4 weeks @ 50C, cps: 40
Visc after freeze/thaw, cps: 480
Solids, %: 6.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/3 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 338

Fabric Softener

Ingredients:	% By Wt.
Water, D.I.	92.8
Accosoft 550-90 HHV	7.2

Mixing Procedure:

Charge water. Heat Accosoft 550-90 HHV to approximately 100F to melt. Slowly add Accosoft 550-90 HHV to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 111
Visc after 4 weeks @ 50C, cps: 95
Visc after freeze/thaw, cps: 640
Solids, %: 6.5
Density, lbs/gal: 8.34

Use Instructions:

Use 1/3 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

Formulation No. 340

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	88.9
Accosoft 550 HC	11.1

Mixing Procedure:

Charge water. Slowly add Accosoft 550HC to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:

Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 40
Visc after 4 wks @ 50C, cps: 110
Visc after freeze/thaw, cps: 450
Solids, %: 10.0
Density, lbs/gal: 8.36

Use Instructions:

Use 1/4 cup in rinse cycle per normal wash load.

Comment:

The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 398

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	88.0
Accosoft 550L-90	11.0
Ninol 1281	1.0

Mixing Procedure:
Charge warm water. Add Ninol 1281 while mixing. Slowly add Accosoft 550L-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 480
Visc after 4 wks @ 50C, cps: 580
Visc after freeze/thaw, cps: 2000
Solids, %: 10.7
Density, lbs/gal: 8.33

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 400

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	92.8
Accosoft 620-90	7.2

Mixing Procedure:
Charge water. Slowly add Accosoft 620-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 115
Visc after 4 weeks @ 50C, cps: 143
Visc after freeze/thaw, cps: 1680
Solids, %: 6.5
Density, lbs/gal: 8.34

Use Instructions:
Use 1/3 cup in rinse cycle per normal wash load.

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 333

Fine Fabric Wash Detergent

Ingredients:	% by Wt.
Water, D.I.	50.9
Alpha-Step ML-40	28.9
Ninol 30-LL	3.9
Steol CS-330	6.7
Sodium chloride	9.6

Mixing Procedure:
Mix ingredients in the order given above, mixing thoroughly between each addition.

Properties:
Appearance: Clear yellow liquid
pH, as is: 8.8
Viscosity @ 25C, cps: 160
Solids, %: 28
Density, lbs/gal: 9.1
Freeze/thaw, 3 cycles: Pass
Cold storage @ 4C, 1 week: Pass

Performance:
The above formulation has been found to be similar in performance to a commercially available product.

Comment:
The surfactants used in this formulation are derived from naturally occurring resources, e.g., coconut or palm kernel oil. They are readily biodegradable. This formulation also contains salt for viscosity control.
Formulation No. 555

Fine Fabric Wash

Ingredients:	% by Wt.
Water, D.I.	61.0
Bio-Soft N-300	18.8
Alpha-Step ML-A	13.0
Ninol 40CO	5.0
Sodium chloride	2.2

Mixing Procedure:
Add ingredients in the order given above.

Properties:
Appearance: Clear yellow liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 200
Solids, %: 25

Use Instructions:
Use 1 to 2 ounces per gallon of water.

SOURCE: Stepan Co.: Formulation No. 470

Hand-Wash Laundry Liquids
Moderate Foam

	%w
Neodol 23-6.5	10.0
Neodol 25-3S (60%)	12.0
FADEA (a)	3.0
Sodium chloride	1.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 451
Clear point, F: 45
Adjust pH to 7.5-8.0 with citric acid.

High Foam, Extra Mild

	%w
Neodol 25-3S (60%)	25.0
FADEA (a)	3.0
Sodium chloride	2.5
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 159
Clear point, F: 46
Adjust pH to 7.5-8.0 with citric acid.

Blending Procedure:
Dissolve the salt in the water. Add the Neodol 23-6.5 with mixing. Add the Neodol 25-3S slowly and with good mixing. Add the amide as a liquid-premelt if necessary.

(a) Fatty acid diethanol amide, Ninol 49CE, Stepan Co., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Heavy Duty Detergent

	%, Wt.
"Star" Silicate	20.0
NaOH (50%)	5.0
Igepal CO-710	5.0
Monafax 1293	5.0
Water	65.0

SOURCE: Mona Industries, Inc.: MONAFAX 1293: Formulas

Heavy-Duty Detergent

The following heavy-duty detergent formulation demonstrates the excellent hydrotroping properties of Monafax 057:

N Silicate	20.0%
Sodium Hydroxide (50%)	5.0%
Nonyl Phenol Ethoxylate (9.5 moles E.O.)	5.0%
Monafax 057	5.0%
Water	65.0%

The above formulation has remained clear for several months.

SOURCE: Mona Industries, Inc.: MONAFAX 057: Formula

Liquid Heavy Duty Laundry Detergent Concentrate

Components:	% by Weight
Water	To 100%
Sodium Citrate	10.0
SXS-40%	10.5
Burco AAS-40	20.0
Burco TME	2.5
Burcowet TMW	2.5
TEA-85%	5.0
Burcosperse AP-Liq.	10.0
Blankophor TX (if desired)	0.5-2.0
Dyes (as desired)	----

Procedure:
Add components in the order listed. Stir until homogeneous bewteen each addition.

SOURCE: Burlington Chemical Co., Inc.: Formulation

Light Duty Liquid Detergent

Monamine ALX-100S	10-20%
Water	80-90%

Concentration of Monamine ALX-100S can be varied depending on specific performance needs.

SOURCE: Mona Industries, Inc.: MONAMINE ALX-100S Formula

Heavy Duty Liquid Laundry Detergent

Ingredients:	% By Wt.
Water, D.I.	29.0
Stepanate SXS	15.0
Ethanol 3A	4.0
Urea	9.0
PVP-K30	0.1
Tinopal CBS-X	0.1
Bio-Soft LD-190	38.8
Sodium citrate	4.0

Mixing Procedure:
Blend ingredients in the order given above.
Properties:
Appearance: Clear liquid
pH, as is: 8.5-9.5
Density, lbs/gal: 9.01-9.17
Viscosity @ 25C, cps: 80-90
Solids, %: 51-54
Use Instructions:
Use 1/2 cup per washload
Formulation No. 295

Liquid Laundry Detergent-Economy

Ingredients:	% by Wt.
Water, D.I.	78.3
Stepanate SXS	0.9
Bio-Soft LD-190	9.6
Sodium chloride	1.9
Urea	9.3

Mixing Procedure:
Blend ingredients in order given.
Properties:
Appearance: Clear liquid
Viscosity @ 25C, cps: 130
pH, as is: 8.4
Solids, %: 20.3
Density, lbs/gal: 8.76
Use Instructions:
Use 1/2 to 1 cup per load.

SOURCE: Stepan Co.: Formulation No. 297

High-Foaming, Light-Duty Liquid Detergent

Triton X-301 is a widely used ingredient of liquid detergents for the household and industrial fields. A basic formulation is a combination of the high-foamer Triton X-301 with a nonionic surfactant, such as Triton X-100. The nonionic contributes excellent detergency to the mixture and solubilizes the less soluble anionic component to yield a clear temperature-stable solution. In general, no additional solubilizer would then be needed. The initial foam and foam stability of this blend satisfy the requirements for high-foaming, light-duty liquid detergents. A typical formulation is:

Ingredients:	Parts
Triton X-301 (as supplied)	50
Triton X-100	20
Water	30

Perfume and dyes may be added. The solids content is 30 percent. Merchandising considerations may dictate the solids content best suited to particular markets. The above basic formulation can be modified to provide floor cleaners, car washes, and other all-purpose cleaners.

SOURCE: Union Carbide Chemicals and Plastics Co., Inc.: Triton Anion Surfactants X-301, 770 Concentrate, and W-30 Concentrate: Formula

Liquid Detergent

Calsoft LAS-99	5.0%
Calsuds CD-6	20.0
Secondary Alcohol Ethoxylate	5.0
Pilot SXS-40	10.0
Water	60.0

Biodegradable LAS-99 gives superior sudsing, grease-cutting and dirt lifting power to liquid detergent formulas that are low in sulfate, pleasant in odor, and uniform in quality.

SOURCE: Pilot Chemical Co.: CALSOFT LAS-99: Formula

Liquid Laundry Detergent

Triton XL-80N Surfactant	4.1
Triton H-66 Surfactant (50%)	26.4
Sodium Alkyl Benzene Sulfonate (60%), LAS	24.5
Coconut Fatty Acid	1.6
Monoethanolamine, MEA	1.6
Citric Acid (anhydrous)	6.6
Sodium Hydroxide (50%)	6.7
Fluorescent Whitener	0.1
Water	28.4

SOURCE: Union Carbide Surfactants: Formula OF#-190

High Solids Fabric Softener

Ingredients:	% by Wt.
Ethylene Glycol	55.0
Accosoft 550L-90	45.0

Mixing Procedure:
Charge ethylene glycol. Slowly add 550L-90 while mixing until homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 248
Visc after 4 wks @ 50C, cps: 530
Visc after freeze/thaw, cps: 463
Softener solids, %: 40.0
Total solids, %: 95.0
Density, lbs/gal: 8.84

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 408

High Solids Fabric Softener

Ingredients:	% by Wt.
Water, DI	40.6
Propylene Glycol	5.0
Isopropanol	10.0
Accosoft 550 HC	44.4

Mixing Procedure:
Charge water. Heat to 80F. Add propylene glycol and IPA with mixing. Slowly add 550 HC while mixing until homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 722
Visc after 4 wks @ 50C, cps: 680
Visc after freeze/thaw, cps: 1272
Softener solids, %: 40.0
Total solids, %: 45.0
Density, lbs/gal: 8.76

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
SOURCE: Stepan Co.: Formulation No. 439

High Solids Fabric Softener

Ingredients:	% by Wt.
Ethylene Glycol	45.0
Accosoft 550L-90	55.0

Mixing Procedure:
Charge ethylene glycol and slowly add 550L-90 while mixing until homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 330
Visc after 4 wks @ 50C, cps: 380
Visc after freeze/thaw, cps: 623
Softener solids, %: 50.0
Total solids, %: 95.0

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 446

Premium Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	90.7
Accosoft 540	9.3

Mixing Procedure:
Charge water. Heat Accosoft 540 to approximately 100F to melt. Slowly add Accosoft 540 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:
Appearance: Opaque liquid
pH, as is: 6.0 typical
Viscosity @ 25C, cps: 200
Visc @ 50C 4 weeks, cps: 250
Visc after freeze/thaw, cps: 1500
Solids, %: 8.0

Use Instructions:
Use 1/4 cup in the rinse cycle per normal wash load.

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 453

Industrial Laundry Detergent-1

Raw Materials:	% by Weight
A. Surfonic JL-80X	20
CMC	1
Water	79
Cloud point, C, 1% soln.: 60	
B. Sodium silicate (2.4:1 SiO2:Na2O)	5
Potassium Hydroxide	14
Tetrapotassium pyrophosphate	10
Water	71

Industrial Laundry Detergent-2

Raw Materials:	% by Weight
A. Surfonic N-102	10
Surfonic N-120	10
CMC	1
Water	79
Cloud point, C, 1% soln.: 76	
B. Sodium silicate (2.4:1 SiO2:Na2O)	5
Potassium Hydroxide	14
Tetrapotassium pyrophosphate	10
Water	71

Industrial Laundry Detergent-3

Raw Materials:	% by Weight
A. Surfonic N-102	20
CMC	1
Water	79
Cloud point, C, 1% soln.: 71	
B. Sodium silicate (2.4:1 SiO2:Na2O)	5
Potassium Hydroxide	14
Tetrapotassium Pyrophosphate	10
Water	71

Industrial Laundry Detergent-4

Raw Materials:	% by Weight
A. Surfonic N-85	20
CMC	1
Water	79
Cloud point, C, 1% soln.: 45	
B. Sodium silicate (2.4:1 SiO2:Na2O)	5
Potassium Hydroxide	14
Tetrapotassium pyrophosphate	10
Water	71

Parts A and B are mixed separately. Add to the wash water as 1 part A to 4 parts B.

SOURCE: Texaco Chemical Co.: Formulas

I&I Laundry
Low Temperature Powder, Caustic

Ingredient:	Wt.%
Neodol 25-7 (1)	7.5
Neodol 25-3 (1)	2.5
Sodium Metasilicate, pentahydrate	32.0
Sodium Tripolyphosphate (2)	18.0
Sodium Hydroxide, granular	26.0
Sodium Sulfate	13.0
Carboxymethyl Cellulose	1.0

(1) Shell Chemical Co.
(2) Monsanto Co. STP Code 101

Low Temperature Powder, Non-Caustic

Ingredient:	Wt.%
Neodol 25-7 (1)	7.5
Neodol 25-3 (1)	2.5
Sodium Metasilicate, pentahydrate	39.0
Sodium Tripolyphosphate (2)	18.0
Sodium Sulfate	9.0
Sodium Carbonate	23.0
Carboxymethyl Cellulose	1.0

(1) Shell Chemical Co.
(2) Monsanto Co. STP Code 101

Powder

Ingredient:	Wt. %
Triton N-101 Surfactant (1)	10.00
Sodium Carbonate	28.00
Sodium Silicate (2)	12.00
Sodium Tripolyphosphate (3)	32.00
Sodium Sulfate	16.62
Carboxymethylcellulose	1.00
Tinopal UNPA (4)	0.30
Tinopal RBS-200 (4)	0.08

(1) Union Carbide Co.
(2) PQ Corp., Britesil C-20
(3) Monsanto Co. STP Code 101
(4) Ciba-Geigy Corp.

Low-Foam Powder

Ingredient:	Wt. %
Triton X-114 Surfactant (1)	5.00
Sodium Tripolyphosphate (2)	40.00
Sodium Silicate (3)	15.00
Soda Ash	38.80
Carboxymethylcellulose	1.00
Tinopal 5BM Extra Conc.	0.20

(1) Union Carbide Co. (3) PQ Corp. Britesil C-24
(2) Monsanto Co. STP Code 101 (4) Ciba-Geigy Corp.

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formulas

I&I Laundry Liquid

Ingredient:	Wt. %
Water	42
Tetrapotassium Pyrophosphate (TKPP) (1)	15
Potassium Silicate (2)	10
Alkanolamide (3)	5
Sodium Xylene Sulfonate (40%)	10
Sodiun Alkylbenzene Sulfonate (60%) (4)	18

(1) Monsanto TKPP Code 600
(2) Such as PQ Corp., Kasil #6, 39%
(3) Such as Stepan Co., Ninol 96-SL
(4) Such as Pilot Chemical, Calsoft L-60

I&I Laundry Liquid

Ingredient:	Wt. %
Neodol 25-9 (1)	3.0
Sodium Metasilicate, pentahydrate	7.6
Tetrapotassium Pyrophosphate (TKPP) (2)	4.6
Potassium Hydroxide (45%)	13.7
Carboxymethylcellulose (CMC)	1.0
Triton H-66 (3)	5.0
Water, dye, perfume, fluorescent whitening agents	to 100%

(1) Shell Chemical or equivalent
(2) Monsanto TKPP, Code 600
(3) Union Carbide Co. or equivalent

I&I Laundry Liquid, Non-Phosphate

Ingredient:	Wt. %
Water	39.1
Sodium Nitrilotriacetate (NTA) (1)	18.0
Sodium Alkylbenzene Sulfonate (2)	10.0
Sodium Xylene Sulfonate (40%)	22.5
Sodium Silicate (47%) (3)	6.4
Alkanolamide (4)	4.0

(1) Monsanto NTA, Code 000
(2) Such as Pilot Chemical, Calsoft F-90 Flake
(3) Such as PQ Corp., RU Silicate
(4) Such as Stepan Co., Ninol 96-SL

I&I Laundry Slurry

Ingredient:	Wt. %
Hydrotroping Surfactant (1)	10.3
Alkylphenol Ethoxylate (2)	10.3
Dequest 2000 (3)	10.3
Water	7.2
Sodium Hydroxide (50%)	61.9

(1) Such as Mona Ind., Phosphoteric T-C
(2) Such as Union Carbide, Triton N-101
(3) Monsanto Co.

SOURCE: Monsanto Co.:Industrial and Institutional Laundry:Formula

I&I Laundry: Liquid, No Phosphate

Ingredient:	Wt. %
NTA (1)	18.0
Sodium Alkylbenzene Sulfonate (LAS)	10.0
Sodium Xylene Sulfonate (40%)	22.5
Fatty Alkanolamide	4.0
RU Silicate (47%) (2)	6.4
Water	39.1

(1) Monsanto Co., Code 000
(2) PQ Corp.

I&I Laundry: Liquid, No Phosphate

Ingredient:	Wt. %
NTA (1)	10.0
Sodium Alkylbenzene Sulfonate (LAS)	10.0
Alcohol Ether Sulfate (58%)	17.2
Sodium Xylene Sulfonate (40%)	20.0
Soap	0.5
RU Silicate (47%) (2)	4.3
Sodium Carbonate	3.0
Water	35.0

(1) Monsanto Co., Code 000
(2) PQ Corp.

SOURCE: Monsanto Co.: NTA: Properties and I&I Applications: Formulas

Two-Step Built Laundry Liquid
(For automatic dispensing equipment capable of dispensing surfactant and builder solutions separately)

Part A. Surfactant Solution:

Ingredients:	Wt. %
Neodol 23-6.5 (1)	20.0
Isopropyl Alcohol	7.0
Carboxymethylcellulose (CMC)	1.0
Water	72.0

(1) Shell Chemical Co. or equivalent

Part B. Builder Solution:

Ingredients:	Wt. %
Sodium metasilicate, pentahydrate	16.8
Tetrapotassium pyrophosphate (TKPP) (1)	9.5
Potassium hydroxide (45%)	30.4
Water	43.3

(1) Monsanto TKPP, Code 600

Blend the nonionic surfactant and builder solutions separately and deliver separately to wash water in the ratio of 1:2.

SOURCE: Monsanto Co.: Industrial and Institutional Laundry: Formulas

I&I Laundry: Powder

Ingredient:	Wt.%
NTA (1)	30.0
Sodium Alkylbenzene Sulfonate (LAS)	18.0
Sodium Silicate	8.0
Sodium Carbonate	5.0
Sodium Sulfate & Minor Ingredients	39.0

(1) Monsanto Co., Code 000

I&I Laundry: Powder

Ingredient:	Wt.%
NTA (1)	30.0
Alcohol Ethoxylate	10.0
Sodium Silicate	8.0
Sodium Carbonate	5.0
Sodium Sulfate & Minor Ingredients	47.0

(1) Monsanto Co., Code 000

I&I Laundry: Powder, With Phosphate

Ingredient:	Wt.%
NTA (1)	15.0
Sodium Tripolyphosphate (2)	24.0
Sodium Alkylbenzene Sulfonate (LAS)	18.0
Sodium Silicate	6.0
Sodium Carbonate	5.0
Sodium Sulfate & Minor Ingredients	32.0

(1) Monsanto Co., Code 000
(2) Monsanto Co., Code 101

I&I Laundry: Powder, With Phosphate

Ingredient:	Wt.%
NTA (1)	10.0
Sodium Tripolyphosphate (2)	24.0
Alcohol Ethoxylate	10.0
Sodium Silicate	6.0
Sodium Carbonate	5.0
Sodium Sulfate & Minor Ingredients	45.0

(1) Monsanto Co., Code 000
(2) Monsanto Co., Code 101

SOURCE: Monsanto Co.: NTA: Properties and I&I Applications: Formulas

I&I Laundry Powder

Ingredient:	Wt.%
Caustic Soda	25
Sodium Metasilicate, Anhydrous	40
Soda Ash	13
Sodium Tripolyphosphate (1)	11
Nonionic Surfactant	10
Carboxymethylcellulose (CMC)	1
Optical Brightener	present

(1) Monsanto STP Code 101

I&I Laundry Powder

Ingredient:	Wt.%
Caustic Soda	13
Sodium Metasilicate, Anhydrous	32
Soda Ash	23
Sodium Tripolyphosphate (1)	16
Anionic Surfactant	8
Nonionic Surfactant	6
Carboxymethylcellulose	2
Optical Brightener	present

(1) Monsanto STP Code 101

I&I Laundry Powder

Ingredient:	Wt.%
Sodium Metasilicate, Anhydrous	75
Sodium Tripolyphosphate (1)	11
Nonionic Surfactant	12
Carboxymethylcellulose (CMC)	2
Optical Brightener	present

(1) Monsanto STP Code 101

Low Temperature I&I Laundry Powder

Ingredient:	Wt.%
Neodol 25-7 (1)	7.5
Neodol 25-3 (2)	2.5
Sodium metasilicate, pentahydrate	32.0
Sodium Tripolyphosphate (STP) (3)	18.0
Sodium Hydroxide, granular	26.0
Sodium sulfate	13.0
Carboxymethylcellulose (CMC)	1.0

(1) Shell Chemical Co. or equivalent
(2) Shell Chemical Co. or equivalent
(3) Monsanto Co., STP Code 101

SOURCE: Monsanto Co.: Industrial and Institutional Laundry: Formulas

Laundry Builder, Silicated, Industrial Supply (Liquid, Medium Alkalinity)

Soil: Petroleum oil and grease, graphite and colored pigment
Surface: Polyester and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	0-20
N Clear	70-90
Sodium Hydroxide (50%)	10-20

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium/Heavy Soil: 0.25%-0.50% by weight or 1-2 lbs per 100 lbs laundry

Notes:
Blend this builder solution to a 1.7-2.0 ratio SiO2 %bw/ Na2O %bw for best stability and industrial detergency.
D or BJ-120 sodium silicates can also be used as builder solutions without blending.
Use builder solution in conjunction with laundry detergent (unbuilt) at 2-4 parts bw of builder to 1 part detergent.

Laundry Builder, Industrial Supply (Powder, Medium Alkalinity)

Soil: Petroleum oil and grease, graphite and colored pigment
Surface: Polyester and cotton/polyester
Application Method: Industrial washing machine
Manufacture: None

Composition:	% Wt
Metso Beads 2048	100.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium Soil: 0.50% by weight or 2 lbs per 100 lbs laundry
Heavy Soil: 0.75% by weight or 3 lbs per 100 lbs laundry

Note: Use in conjunction with laundry detergent (unbuilt) at 2-4 parts bw of builder with 1 part detergent.

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Laundry Builder, Silicated-Linen Supply (Liquid, High Alkalinity)

Soil: Acidic food fat, oil and grease; blood, sebum and body waste
Surface: Polyester and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Mix tank with propeller stirrer

Composition A:	% Wt
Potassium Hydroxide (45%)	35-45
N Clear or E	55-65
Composition B:	**% Wt**
Water	11.0
Potassium Hydroxide (Solid)	37.0
N Clear or E	52.0
Composition C:	**% Wt**
Water	6.0
Potassium Hydroxide (Solid)	28.0
N Clear or E	52.0
Sodium Hydroxide (Solid)	14.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium to Heavy Soil: 0.25%-0.50% by weight or 1-2 lbs per 100 lbs laundry

Note: Use builder solution in conjunction with laundry detergent (unbuilt) at 2-4 parts bw of builder to 1 part detergent.

Laundry Detergent--Linen Supply (Powder, Low Alkalinity)

Soil: Acidic food fat, oil and grease; blood, sebum and body waste
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Britesil H20	20.0
STPP	26.0
Sodium Carbonate	28.0
*Nonylphenoxy Polyethoxyethanol, 9-10 moles EO	10.0
Sodium Sulfate	10.0
Carboxymethylcellulose (CMC)	2.0
**Sodium alkylaryl sulfonate powder (90%)	4.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium Soil: 0.50% by weight or 2 lbs per 100 lbs laundry
Heavy Soil: 0.75% by weight or 3 lbs per 100 lbs laundry
*Rohm & Haas, Union Carbide, GAF
**Stepan, Witco

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Laundry Detergent (Built)-Institutional Supply (Liquid)

Soil: Body oil and perspiration, body waste, make-up, food soil
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Mix tank with propeller stirrer

Composition A:	% Wt
Water	54.5
TKPP	4.6
Potassium Hydroxide (45%)	13.7
Starso	15.0
Sodium Hydroxide (50%)	4.2
*Phosphate Ester	5.0
**C12-C15 Linear Alcohol, 9 Moles EO	5.0

Composition B:	
Water	59.1
Potassium Hydroxide (45%)	13.7
Starso	15.0
Sodium Hydroxide (50%)	4.2
*Phosphate Ester	5.0
**C12-C15 Linear Alcohol, 9 Moles EO	3.0

Use Dilution: 0.25%-0.50% by weight or 1-2 lbs per 100 lbs laundry

* Rohm & Haas
** Shell Chemical

Laundry Detergent (Built)-Institutional Supply (Liquid)

Soil: Body oil and perspiration, body waste, make-up, food soil
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	28.7
Fluorescent Brightener	0.1
Carboxymethylcellulose (CMC)	0.5
*Acrysol ASE-108	6.0
**Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	10.0
Potassium Hydroxide (45%)	2.2
TKPP (60%)	40.0
Kasil #6	12.5

Use Dilution: 0.25%-0.50% by weight or 1-2 lbs per 100 lbs laundry

* Rohm & Haas
** Rohm & Haas, Union Carbide, GAF

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Laundry Detergent-Commercial
Built Laundry Liquid(a)
High Quality with Phosphate

Part A: Stabilizer System:	%w
Water	57.7
Neodol 1-5 (b)	0.05
Gantrez AN-149	0.95
Potassium hydroxide (45%)	4.0
Part B: Detergent System:	
Dye and fluorescent whitening agent(s)	As desired
CMC (d)	0.5
Sodium silicate (e)	4.0
Neodol 1-5 (b)	10.0
Tetrapotassium pyrophosphate	25.0

Properties:

Viscosity, 73F, cps: 309

Preparation Procedure:

The components are added in the order listed.

1. Bring the water temperature to at least 140F while stirring with moderate agitation.
2. Add the Neodol ethoxylate, then slowly add the Gantrez AN-149 powder, while bringing the mixture temperature to 190F. Continue stirring with moderate agitation until the mixture becomes clear. At this point, the stabilizer reaction is complete.
3. When the solution is clear, add the potassium hydroxide while stirring.
4. The stirrer speed is then increased to maximize stirring efficiency through the remainder of the procedure. Very high shear stirring is required, i.e., 650 ft./min. in a 1.5 liter container.
5. Dye and fluroescent whitening agents are added, if desired.
6. The CMC, sodium silicate and the bulk of the Neodol ethoxylate are added in that order with thorough mixing between addition of each of these components.
7. The tetrapotassium pyrophosphate is added, and the final mixture is stirred until homogeneous. The finished product can then be bottled and allowed to cool slowly.

With exception of the Gantrez AN-149, all other ingredients may be added as water solutions--with appropriate adjustment for the total water content. Care should be taken throughout the procedure to minimize water evaporation.

(a) For more information, refer to Shell Chemical Company Technical Bulletin SC:216.

(b) May substitute with Neodol 25-7. For high temperature use substitute with Neodol 25-9 or Neodol 1-9.

(d) Carboxymethylcellulose

(e) Mole ratio $Na_2O:SiO_2=1.2.4$, such as RU Silicate, PQ Corp., or equivalent product. The system is somewhat sensitive to sodium silicate concentrations in excess of the 4%w recommended. An increase contributes to higher viscosity and somewhat lower shelf life stability.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Laundry Detergents-Commercial
Built Laundry Liquids
Premium Quality with Phosphate

	%w
Neodol 1-5 (a)	18.0
C12LAS (60%) (b)	5.5
Sodium metasilicate, anhydrous basis	5.0
Tetrapotassium pyrophosphate	20.0
Potassium hydroxide (45%)	2.0
Carbopol 616 (2.5%) (c)	20.0
Sodium xylene sulfonate (40%)	7.5
Water, dye, fluorescent whitening and antiredeposition agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 830
- Phase coalescence temp., F: >165
- pH: 14
- Freeze-thaw test (3 cycles): Pass

Premium Quality Non-Phosphate

	%w
Neodol 1-5 (a)	18.0
C12LAS (60%) (b)	5.5
Sodium metasilicate, anhydrous basis	4.0
NTA (d)	15.0
Sodium carbonate	5.0
Carbopol 616 (2.5%) (c)	15.0
Sodium cumene sulfonate (45%)	10.0
Water, dye, fluorescent whitening and antiredeposition agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 687
- Phase coalescence temp., F: >165
- pH: 13
- Freeze-thaw test (3 cycles): Pass

Blending Procedure:
Add Carbopol slowly to warm water, then add builders, hydrotrope and surfactants with good agitation.

(a) May substitute with Neodol 25-7. For high temperature use substitute with Neodol 25-9.
(b) Witconate 1260, Witco Corp., or equivalent product.
(c) B.F. Goodrich Co., or equivalent product.
(d) Nitrilotracetic acid, trisodium salt. May substitute with ethylene-diaminotetraacetic acid (EDTA).

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Detergents-Commercial
Two-Step Built Laundry Liquid Formulations(a)

Part A: Surfactant Solution
For Low or Regular Temperature Operation

	%w
Neodol 23-6.5 (b)	20.0
Isopropyl alcohol	7.0
CMC (c)	1.0
Water	72.0

Properties:
- Viscosity, 73F, cps: 156
- Cloud point, 1% soln., F: 110
- Clear point, F: 30

For High Temperature Operation

	%w
Neodol 25-9	20.0
CMC (c)	1.0
Water	79.0

Properties:
- Viscosity, 73F, cps: 54
- Cloud point, 1% soln, F: 160
- Clear point, F: 41

Part B: Builder Solution
Phosphate/Caustic

	%w
Sodium metasilicate, pentahydrate	16.8
Tetrapotassium pyrophosphate	9.5
Potassium hydroxide (45%)	30.4
Water	43.3

Phosphate/Non-Caustic

	%w
Sodium metasilicate, pentahydrate	19.5
Tetrapotassium pyrophosphate	9.0
Potassium carbonate	11.5
Water	60.0

Non-Phosphate/Caustic

	%w
Sodium metasilicate, pentahydrate	26.4
Potassium hydroxide (45%)	13.5
Potassium carbonate	7.6
Water	52.5

Non-Phosphate/Non-Caustic

	%w
Sodium metasilicate, pentahydrate	25.5
Potassium carbonate	14.5
Water	60.0

(a) For automatic dispening equipment capable of dispensing surfactant and builder solutions separately.
(b) May replace with Neodol 1-5 or 25-7
SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Laundry Detergent-Commercial
Unbuilt Liquids (a)
Premium Quality

	%w
Neodol 1-5	40.0
C12 LAS (60%) (b)	16.7
Sodium sesquicarbonate	2.5
Sodium xylene sulfonate (40%)	10.0
Ethanol	2.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 76
- Phase coalescence temp., F: >165
- Clear point, F: 30
- pH: 10

High Quality

	%w
Neodol 23-6.5	37.5
C12 LAS (60%) (b)	20.8
Ethanol	6.0
Triethanolamine	3.0
Potassium chloride	1.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 105
- Phase coalescence temp., F: 130
- Clear point, F: 32
- pH: 10

(a) For use at wash temperatures of 80-140F. Add bleach in separate step.
(b) Witconate 1260, Witco Corp., or equivalent product. May use the appropriate amount of linear dodecylbenzene sulfonic acid with an equivalent amount of sodium hydroxide to neutralize it.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Detergent-Commercial
Unbuilt Liquid (a) (Continued)
Good Quality

	%w
Neodol 91-6	15.0
Neodol 23-6.5	15.0
C12 LAS (60%) (b)	16.7
Sodium sesquicarbonate	2.0
Ethanol	1.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 135
- Phase coalescence temp., F: >176
- Clear point, F: 32
- pH: 10

Blending Procedure:

For the preparation of unbuilt, clear-type, HDL formulations, the order of addition is of importance to minimize viscosity resistance to mixing and to avoid possible gel formation. Effective stirring should be maintained during addition of all ingredients, and each ingredient should be in solution before the next is added. A blending temperature somewhat above ambient (e.g., 80-90F) is recommended but not essential.

1. Put the water, ethanol and potassium chloride into the mixing vessel and add the triethanolamine.
2. Add the Neodol ethoxylate(s) with efficient stirring.
3. Add the linear alkylbenzene sodium sulfonate (LAS) and mix thoroughly.
4. Add the fluorescent whitening agent(s) with rapid stirring.
5. Add perfume and dye as needed to give the desired odor and color.

(a) For use at wash temperatures of 80-140F. Add bleach in separate step.
(b) Witconate 1260, Witco Corp., or equivalent product. May use the appropriate amount of linear dodecylbenzene sulfonic acid with an equivalent amount of sodium hydroxide to neutralize it.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Detergents-Commercial
Regular Quality Built Laundry Liquids (a)
Highly Alkaline Liquids
With Phosphate

	%w
Neodol 25-9	3.0
Sodium metasilicate, pentahydrate	7.6
Tetrapotassium pyrophosphate	4.6
Potassium hydroxide (45%)	13.7
CMC (b)	1.0
Phosphate ester (c)	5.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:

Viscosity, 73F, cps: 23
Phase coalescence temp., F: 172
Clear point, F: 45

Non-Phosphate

	%w
Neodol 25-9	3.0
Sodium metasilicate, pentahydrate	11.9
Potassium hydroxide (45%)	6.1
Potassium carbonate	3.4
CMC (b)	1.0
Sodium cumene sulfonate (45%)	8.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:

Viscosity, 73F, cps: 9
Phase coalescence temp., F: 140
Clear point, F: 25

(a) Use where equipment is not capable of metering in the wash ingredients spearately. Use two-step product with metering-capable machines.
(b) Carboxymethylcellulose

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formula

Laundry Detergents-Commercial
Regular Quality Built Laundry Liquids (a)
Lower Alkalinity Liquid
With Phosphate

	%w
Neodol 25-9	3.0
Sodium metasilicate, pentahydrate	8.8
Tetrapotassium pyrophosphate	4.0
Potassium carbonate	5.2
CMC (b)	1.0
Phosphate ester (c)	5.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 23
- Phase coalescence temp., F: 176
- Clear point, F: 50

Lower Alkalinity Liquid
Non-Phosphate

	%w
Neodol 25-9	3.0
Sodium metasilicate, pentahydrate	11.5
Potassium carbonate	6.5
CMC (b)	1.0
Sodium xylene sulfonate (40%)	9.0
Ethanol	2.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 21
- Phase coalescence temp., F: >165
- Clear point, F: 25

(a) Use where equipment is not capable of metering in the wash ingredients separately. Use two-step product with metering-capable machines.
(b) Carboxymethylcellulose
(c) Triton H-66, Union Carbide Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Detergent, Consumer (Concentrated, high density powder, dry blended)

Soil: Acidic food fat and protein, body perspiration, grass and dirt
Surface: Polyester, cotton/polyester, cotton
Application Method: Home washing machine
Manufacture: Ribbon or paddle blender

Composition:	%Wt
Britesil H20	25.0
STPP (dense powder)	40.0
Sodium Carbonate (dense powder)	13.0
Carboxymethylcellulose (CMC)	1.5
Sodium Alkylaryl Sulfonate Powder (90%)	14.0
C12-C15 Linear Alcohol, 7 moles EO	6.0
Optical Brightener, Perfume	0.5

* Density (lb/ft3) range: 45-62
(g/cc) range: 0.7-1.0
(*Note: Density of finished product is dependent on powdered raw materials particle size and density)

Use Dilution:
Light soil: 1/4 cup, normal load
Medium to heavy soil: 1/3-1/2 cup, normal load

Laundry Detergent (Non-Phosphate), Consumer (Concentrated, high density powder, dry blended)

Soil: Acidic food fat and protein, body perspiration, grass and dirt
Surface: Polyester, cotton/polyester, cotton
Application method: Home washing machine
Manufacture: Ribbon or paddle blender

Composition:	%Wt
Valfor 100	30.0
Britesil H20	30.0
Sodium Carbonate (dense powder)	13.0
Sodium Polyacrylate (MW 4500-5500)	3.0
Carboxymethylcellulose (CMC)	1.5
Sodium Alkylaryl Sulfonate Powder (90%)	10.0
C12-C15 Linear Alcohol, 7 moles EO	12.0
Optical Brightener, Perfume	0.5

* Density (lb/ft3) range: 38-56
(g/cc) range: 0.6-0.9

(*Note: Density of finished product is dependent on powdered raw material particle size and density).

Use Dilution: Light soil: 1/4 cup, normal load
Medium to heavy soil: 1/3-1/2 cup, normal load

DSOURCE: The PQ Corp.: PQ Formulary: Formulas

Laundry Detergent, Consumer (Powder, Dry Blended)

Soil: Acidic food fat and protein, body perspiration, grass and dirt
Surface: Polyester, cotton/polyester, cotton
Application Method: Home washing machine
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Britesil C24	20.0
STPP	30.0
Sodium Carbonate	10.5
Sodium Sulfate	24.0
Carboxymethylcellulose (CMC)	1.0
*Sodium Alkylaryl Sulfonate Powder (90%)	10.0
**C12-C15 Linear Alcohol, 7 Moles EO	4.0
Optical Brightener, Perfume	0.5

Use Dilution:
Light Soil: 1/2 cup, normal load
Medium to Heavy Soil: 3/4-1 cup, normal load
* Stepan, Witco
**Shell, Vista, Union Carbide

Laundry Detergent, I and I-Unbuilt (Liquid)

Soil: Acidic food fat, oil and grease
Surface: Cotton, cotton/polyester, polyester
Application Method: Industrial washing machine
Manufacture: Mix tank with propeller stirrer

Composition A:		% Wt
Water		Balance
Fluroescent Brightener		0.2
*Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO		20-30
**Alkylaryl Sulfonic Acid (98%)		5-10
Sodium Hydroxide (50%)	(Add to pH)	6- 8

Composition B:	% Wt
Water	Balance
Fluorescent Brightener	0.2
*Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	20-30
***Coconut Diethanolamide	5-10

Use Dilution:
Light Soil: 0.06% by weight or 4 oz per 100 lbs laundry
Medium Soil: 0.06%-0.12% by weight or 4-8 oz per 100 lbs laundry
Heavy Soil: 0.12%-0.25% by weight or 8-16 oz per 100 lbs laundry
Note: Use laundry detergent, unbuilt in conjunction with laundry builder, silicated (both linen and industrial) at 1 part bw detergent to 2-4 parts builder solution.
*Rohm & Haas, Union Carbide, GAF **Stepan, Witco
***Alcolac, Sherex
The PQ Corp.: PQ Formulary: Formulas

Laundry Detergent-Industrial and Institutional Supply (Powder, Low Alkalinity)

Soil: Petroleum oil and grease, graphite and colored pigments
Surface: Polyester and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Britesil C24	20.0
STPP	16.0
Sodium Carbonate	20.0
Sodium Sulfate	30.0
Polyvinylpyrrolidone (PVP)	1.0
Carboxymethylcellulose	1.0
*Nonylphenoxy Polyethoxyethanol, 9-10 moles EO	12.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium Soil: 0.50% by weight or 2 lbs per 100 lbs laundry
Heavy Soil: 0.75% by weight or 3 lbs per 100 lbs laundry

* Rohm & Haas, Union Carbide, GAF

Laundry Detergent (Non-Phosphate)-Industrial Supply (Powder, medium Alkaline)

Soil: Petroleum oil and grease, graphite and colored pigment
Surface: Polyester and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Valfor 100	14.0
Sodium Carbonate	20.0
*Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	14.0
Sodium Sulfate	20.0
**Polyvinylpyrrolidone (PVP)	1.0
Carboxymethylcellulose (CMC)	1.0
Metso Beads 2048	30.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium Soil: 0.50% by weight or 2 lbs per 100 lbs laundry
Heavy Soil: 0.75% by weight or 3 lbs per 100 lbs laundry

Note: Use Britesil C24 in place of Metso Beads 2048 partially or fully, if lower alkalinity is desired and more suspending/emulsifying power is needed. Britesil C24 will also increase the surfactant absorbency of a detergent blend.

* Rohm & Haas, Union Carbide, GAF ** BASF

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Laundry Detergent, Linen Supply (Powder. High Alkalinity)

Soid: Acidic food fat, oil and grease; blood, sebum and body waste
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition:	%Wt
Metso Beads 2048	30.0
Sodium Carbonate	20.0
STPP	20.0
*Sodium Alkylaryl Sulfonate Powder (90%)	12.0
Carboxymethylcellulose (CMC)	2.0
Sodium Hydroxide Beads	16.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium to Heavy Soil: 0.25%-0.50% by weight or 1-2 lbs per 100 lbs laundry

* Stepan, Witco

Laundry Builders, Linen Supply (Powder, High Alkalinity)

Soil: Acidic food fat, oil and grease; blood, sebum and body waste
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition A:	%Wt
Metso Beads 2048	60.0
Sodium Hydroxide Beads	40.0

Composition B:	%Wt
Metso Beads 2048	30.0
STPP	20.0
Sodium Carbonate	28.0
Carboxymethylcellulose	2.0
Sodium Hydroxide Beads	20.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium Soil: 0.50% by weight or 2 lbs per 100 lbs laundry
Heavy Soil: 0.75% by weight or 3 lbs per 100 lbs laundry

Note: Use these alkali builders in conjunction with laundry detergent (unbuilt) at 2-4 parts bw of builder with 1 part detergent.

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Laundry Detergent-Linen Supply (Powder, Medium Alkalinity)

Soil: Acid food fat, oil and grease; blood, sebum and body waste
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Sodium Carbonate	30.0
STPP	20.0
*Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	8.0
Sodium Sulfate	6.0
**Sodium Alkylaryl Sulfonate Powder (90%)	4.0
Metso Beads 2048	30.0
Carboxymethylcellulose	2.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium to Heavy Soil: 0.25-0.50% by weight or 1-2 lbs per 100 lbs laundry

* Rohm & Haas, Union Carbide, GAF
** Stepan, Witco

Laundry Builder, Silicated and Phosphated-Linen Supply (Liquid, High Alkalinity)

Soil: Acidic food fat, oil and grease; blood, sebum and body waste
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Mix tank with propeller stirrer

Composition A:	% Wt
Water	34.1
TKPP	10.0
Potassium Hydroxide (45%)	30.4
Star	18.0
Sodium Hydroxide (50%)	7.5
Composition B:	**% Wt**
Water	25.6
TKPP	10.0
Potassium Hydroxide (45%)	30.4
Star	24.0
Sodium Hydroxide (50%)	10.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium to Heavy Soil: 0.25%-0.50% by weight or 1-2 lbs per 100 lbs laundry
Use: Use builder solution in conjunction with laundry detergent (unbuilt) at 2-4 parts of builder to 1 part detergent.

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Laundry Detergents-Liquids
Laundry Liquid Concentrate

	%w
Neodol 25-7	15.0
Neodol 91-8	15.0
C12LAS (60%)(a)	16.7
Sodium carbonate	0.87
Sodium bicarbonate	0.87
Water	51.56

Properties:
Active matter, %w: 40
Viscosity, 73F, cps: 240
pH: 9.8

Blending Procedure:
Dissolve the sodium carbonate and sodium bicarbonate in the water. With stirring add the linear alkylbenzene sodium sulfonate (LAS), then the Neodol 91-8, then the Neodol 25-7.

Note:
By addition of fluorescent whitening agent(s), dye and perfume, this concentrate can be used as a premium laundry liquid, or it can be diluted as shown below to make less concentrated products.

(a) Witconate 1260, Witco Corp., or equivalent product.

Laundry Liquids from Concentrate: Good Quality

	%w
Concentrate	87.5
Sodium carbonate	0.34
Sodium bicarbonate	0.34
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
Viscosity, 73F, cps: 220
Clear point, F: 43

SOURCE: Shell Chemical Co.; NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Detergents-Liquids (Continued)
Laundry Liquid from Concentrate
Store Brand

	%w
Concentrate	75.0
Sodium carbonate	0.44
Sodium bicarbonate	0.44
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
Viscosity, 73F, cps: 240
Clear point, F: 43

Laundry Liquid from Concentrate
Economy

	%w
Concentrate	62.5
Sodium carbonate	0.28
Sodium bicarbonate	0.28
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
Viscosity, 73F, cps: 250
Clear point, F: 43

Laundry Liquid from Concentrate
Generic

	%w
Concentrate	50.0
Sodium carbonate	0.63
Sodium bicarbonate	0.63
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties
Viscosity, 73F, cps: 180
Clear point, F: 43

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Detergent (Non-Phosphate), Consumer (Powder)

Soil: Acidic food fat and protein, body perspiration, grass and dirt
Surface: Polyester and cotton/polyester, cotton
Application Method: Home washing machine
Manufacture: Ribbon on paddle blender

Composition:	% Wt
Valfor 100	20.0
Britesil C24	20.0
Sodium Carbonate	10.0
*Sodium Polyacrylate (MW 4500-5500)	2.0
Sodium Sulfate	32.0
**Sodium Alkylaryl Sulfonate Powder (90%)	10.0
***Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	4.0
Carboxymethylcellulose (CMC)	1.0
Polyvinylpyrrolidone (PVP)	1.0

Use Dilution:
Light Soil: 1/2 cup, normal load
Medium to Heavy Soil: 3/4-1 cup, normal load

*Rohm & Haas, BASF, BF Goodrich
**Stepan, Witco
***Rohm & Haas, Union Carbide, GAF

Laundry Detergent (Non-Phosphate)-Linen Supply (Powder, Medium Alkalinity)

Soil: Acidic food fat, oil and grease: blood, sebum and body waste
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Valfor 100	20.0
Sodium Carbonate	28.0
*Sodium Polyacrylate (MW 4500-5500)	2.0
**Sodium Alkylaryl Sulfonate Powder (90%)	4.0
***Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	8.0
Metso Beads 2048	36.0
Carboxymethylcellulose (CMC)	2.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium Soil: 0.50% by weight or 2 lbs per 100 lbs laundry
Heavy Soil: 0.75% by weight or 3 lbs per 100 lbs laundry
*Rohm & Haas, BASF, BF Goodrich ** Stepan, Witco
***Rohm & Haas, Union Carbide, GAF

SOURCE: The PQ Corp.: PQ Formulary: Foamulas

Laundry (Dry Powder): Machine

	%
Sodium tripolyphosphate, hexahydrate	40-45
Sodium metasilicate, pentahydrate	20-25
Poly-Tergent B-300 or SL-62	10-15
Sodium sulfate	10-15
Sodium carboxymethylcellulose	0.5- 1
Optical brightener	0.5- 1
Sodium carbonate	Balance

Laundry (liquid): Machine

	%
Sodium alkylbenzene sulfonate	22
Poly-Tergent SL-42	18
Ethanol	8
Miscellaneous	6
Triethanolamine	4
Water	42

Laundry (Light Duty Liquid): Hand

	%
Linear alkylbenzene sulfonate	20
Poly-Tergent SL-62	15
Coconut amide	5
Color, fragrance, etc.	As desired
Water	60

SOURCE: Olin Chemicals: POLY-TERGENT Surfactants: Formulas

Fine Fabric Wash Detergent

Ingredients:	% by Wt.
Water, D.I.	48.5
Ethanol 3A	7.6
Bio-Soft EA-10	22.7
Steol CS-460	21.2

Mixing Procedure:

Add ethanol to the water. Slowly add Bio-Soft EA-10 to the mixing solution. Slowly add Steol CS-460 and mix to a homogeneous solution. Adjust pH to 6.5-7.5 with citric acid if necessary.

Properties:

Appearance: Clear, light straw liquid
pH, as is: 6.5-7.5
Viscosity @ 25C, cps: 90-120
Cloud point, F: <40
Freeze/thaw, 3 cycles: Pass
Solids, %: 34-35

Performance:

Ross-Miles Foam Test 0.1% conc in Chicago tap @ 25C:
Initial foam height: 10 cm Foam after 5 min: 9 cm
Draves Wetting Test 0.1% conc in Chicago tap @ 25C:
Wets in 34 seconds
A good biodegradable liquid laundry detergent.

SOURCE: Stepan Co.: Formulation No. 282

Laundry Liquids With Enzymes
Premium Quality

	%w
Neodol 23-6.5 (a)	30.0
Neodol 25-3S (60%)	20.0
Triethanolamine	1.0
Enzyme system (b)	1.0-2.0
Stabilizer (c)	1.0
Ethanol SD-3A	5.0
Potassium chloride	4.0
Fluorescent whitening agent(s)	0.3-0.5
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 140
- Clear point, F: 39
- Temperature stability, 140F for 1 week: pass
- Freeze-thaw test (3 cycles): Pass

Use Concentration: 1/4 cup

Good Quality

	%w
Neodol 23-6.5 (a)	30.0
C12LAS (60%) (d)	10.0
Triethanolamine	1.0
Enzyme system (b)	1.0-2.0
Stabilizer (c)	1.0
Ethanol SD-3A	5.0
Potassium chloride	2.0
Fluoresecent whitening agent(s)	0.3-0.5
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 145
- Clear point, F: 18
- Temperature stability, 140F for 1 week: pass
- Freeze-thaw test (3 cycles): pass

Use Concentration: 1/4 cup

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Liquids with Enzymes(Continued)
With Fabric Softener and Enzymes

	%w
Neodol 25-9	24.0
Softener (e)	5.0
Triethanolamine	1.0
Enzyme system (b)	1.0
Stabilizer (c)	1.0
Ethanol SD-3A	10.0
Fluorescent whitening agent(s)	0.3-0.5
Water, dye, perfume	to 100%

Properties:

Viscosity, 73F, cps: 80
Clear point, F: 62
Temperature stability, 140F for 1 week: Pass
Freeze-thaw test (3 cycles): pass

Use Concentration: 1/2 cup

(a) NEODOL 25-7 or 25-9 may be used in place of NEODOL 23-6.5.
(b) Protease and/or amylase enzymes from Novo Industries, IBIS, Miles Laboratories, or any equivalent source may be used.
(c) Stabilizers currently used are patented and may include short chain carboxylic acid salts (formates, acetates) and boric acid esters. Their use may violate patent rights. Use of Neodol 25-3S as anionic surfactant minimizes need for stabilizer.
(b) Witconate 1260, Witco Corp., or equivalent product.
(e) Armosoft WA104, Akzo Chemie America, or any comparable product can be used.

Blending Procedure:

For the preparation of unbuilt, clear-type, HDL formulations, the order of addition is of importance to minimize viscosity resistance to mixing and to avoid possible gel formation. Effective stirring should be maintained during addition of all ingredients, and each ingredient should be in solution before the next is added. A blending temperature somewhat above ambient (e.g., 80-90F) is recommended but not essential.

1. Put the water into the mixing vessel and add the potassium chloride.
2. Add the ethanol, triethanolamine and stabilizer.
3. Add the linear alkylbenzene sodium sulfonate (LAS) slurry, if indicated.
4. Add the NEODOL alcohol ethoxylate. Be sure to have efficient stirring, and, if feasible, add it near the vortex of the stirrer.
5. Add the Neodol 25-3S and the softener slowly with stirring, where indicated.
6. Add the fluorescent whitening agent with rapid stirring.
7. Add perfume and dye as needed to give the desired odor and color.
8. Add the enzyme system last. Adjust pH to 7-9, if necessary. The fluorescent whitening agent(s) are the slowest dissolving of all the ingredients.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Laundry Powders-Commercial
Low Temperature Powder (a)
Phosphate/Caustic

	%w
Neodol 25-7	7.5
Neodol 25-3	2.5
Sodium metasilicate, pentahydrate	32.0
Sodium tripolyphosphate, anhydrous basis	18.0
Sodium hydroxide, beads	26.0
Sodium sulfate	13.0
CMC (b)	1.0

Phosphate/Non-Caustic

	%w
Neodol 25-7	7.5
Neodol 25-3	2.5
Sodium metasilicate, pentahydrate	39.0
Sodium tripolyphosphate, anhydrous basis	18.0
Sodium sulfate	9.0
Sodium carbonate	23.0
CMC (b)	1.0

Non-Phosphate/Non-Caustic

	%w
Neodol 25-7	6.0
Neodol 25-3	2.0
Sodium metasilicate, pentahydrate	58.0
Sodium carbonate	33.0
CMC (b)	1.0

Blending Procedure:
Mix solid builders and fillers thoroughly. Add non-ionic slowly while mixing, mix thoroughly. Add CMC and fluorescent whitening agents (as desired).

(a) For higher use temperatures (e.g., 150F or above) replace Neodol 25-7 and Neodol 25-3 with Neodol 25-9.
(b) Carboxymethylcellulose.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Prespotters
Pump Spray-Type
Premium Quality

	%w
Neodol 25-3 (a)	10.0
Neodol 23-6.5	10.0
Shell Sol 71 or 72 (b)	20.0
Isopropyl alcohol	12.0
Triethanolamine oleate (c)	3.5
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 37
Clear point, F: 18

Premium Quality (d)

	%w
Neodol 25-3 (a)	22.0
Shell Sol 71 or 72 (b)	18.0
Sodium xylene sulfonate (40%)	30.0
Triethanolamine oleate (c)	2.5
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 218
Clear point, F: 37

Blending Procedure:
Add water last, mix vigorously.

(a) May substitute with Neodol 23-3.
(b) Isoparaffinic solvent, b.p. 356-401F, Shell Chemical Co.
(c) Can be prepared in situ from triethanolamine and oleic acid.
(d) Good also for dispenser type product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Laundry Prespotter-Solvent Base/Pump Spray Type

Raw Materials:	% by Weight
Surfonic L24-3	10.0
Surfonic L24-7	10.0
Texsolve E or Texsolve S-LO	20.0
Isopropyl Alcohol	12.0
Triethanolamine oleate	3.5
Water, dye, perfume	to 100%

Laundry Prespotter-Water Base/Pump Spray Type

Raw Materials:	% by Weight
Surfonic L24-7	9.75
Surfonic L24-3	5.25
Sodium Xylene Sulfonate (40%)	15.00
EDTA salt	0.50
Water, dye, perfume	to 100%

Laundry Prespotter-Water Base/Pump Spray Type-Economy Formula

Raw Materials:	% by Weight
Surfonic L24-7	5.20
Surfonic L24-3	2.80
Sodium Xylene Sulfonate	8.75
EDTA salt	0.50
Water, dye, perfume	to 100%

** The Sodium Xylene Sulfonate quantities may be adjusted as needed to maximize stability.

SOURCE: Texaco Chemical Co.: Formulas

Light Duty Liquid for Fine Washables

Ingredients:	% wt/wt
Linear Alkylaryl TEA Sulfonate (60%)	20.00
Carsonol SES-S (60%)	4.20
Barlox C (30% active)	2.10
Amphoterge SB (40% active)	2.00
Unamide C-72-3	1.00
Tetrapotassium pyrophosphate	3.00
Tinopal SWN-Conc.	0.10
Water	67.55
Dantogard	q.s.
Fragrance	q.s.

pH: approx. 8.2
Viscosity: approx. 450 cps
Solids x 20.0%

Preparative Procedure:

Charge all of the water into the mixing vessel. Important: Utilize hot water at least 50-55C or higher. With agitation, add Tinopal SWN brightener, Carsonol ether sulfate and TEA sulfonate and continue stirring until all particulate matter has been dissolved (approx. 1-2 hours). Add the remaining surfactants and slowly add the tetrapotassium pyrophosphate. Continue stirring to a clear, uniform solution. Add Dantogard in sufficient quantity to insure adequate shelf life.

Formula S-61-6

Fine-Fabric Detergent

Ingredients:	% wt/wt
Barlox 12 (30% sol'n.)	5.00
Unamide LDL	2.00
Sodium linear alkylate sulfonate (60% sol'n)	15.00
Sodium alpha olefin sulfonate (40% sol'n)	25.00
Citric acid, anhydrous	0.25
Water	52.75

pH: 7-7.5
Viscosity: approx. 1000 cps

Preparative Procedure:

Dissolve the citric acid in the water and, with agitation, add the remaining ingredients in the order listed. After the final ingredient has been added, stir for an additional fifteen (15) minutes to insure batch uniformity.

Formula C-17-7

SOURCE: Lonza, Inc.: Household, Industrial & Institutional Cleaners: Formulas

Liquid Detergent-1

Raw Materials:	% by Weight
Surfonic N-85	34.3
C12 LAS Witconate 1238	5.0
Triethanolamine	5.7
Ethanol	6.0

Active, wt%: 45.0
Viscosity, cs, 25C: 224
60F: 608

Liquid Detergent-2

Raw Materials:	% by Weight
Surfonic N-85	40.0
C12 LAS Witconate 1238	5.0
Triethanolamine	0
Ethanol	8.0

Active, wt %: 45.0
Viscosity, cs, 25C: 231
60F: 608

Liquid Detergent-3

Raw Materials:	% by Weight
Surfonic N-85	25.7
C12 LAS Witconate 1238	5.0
Triethanolamine	4.3
Ethanol	6.0

Active, wt %: 35.0
Viscosity, cs, 25C: 224
60F: 540

Liquid Detergent-4

Raw Materials:	% by Weight
Surfonic N-85	30.0
C12 LAS	10.0
Triethanolamine	5.0
Ethanol	6.0

Active, wt%: 45.0
Viscosity, cs, 25C: 204
60F: 445

SOURCE: Texaco Chemical Co.: Formulas

Liquid Detergent-5

Raw Materials:	% by Weight
Surfonic N-85	21.4
C12 LAS	10.0
Triethanolamine	3.6
Ethanol	6.0

Active, wt %: 35.0
Viscosity, cs, 25C: 171
60F: 402

Liquid Detergent-6

Raw Materials:	% by Weight
Surfonic N-85	17.1
C12 LAS	5.0
Triethanolamine	2.9
Ethanol	4.0

Active, wt %: 25.0
Viscosity, cs, 25C: 131
60F: 697

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-95	15.0
C12 LAS	7.0
Triethanolamine	3.0
Ethanol	0

Active, wt %: 25.0
Viscosity, cs, 25C: 140
60F: 269

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-100	20.0
C12 LAS	6.6
Triethanolamine	3.4
Ethanol	0
Sodium Xylene Sulfonate	2.0

Active, wt %: 30.0
Viscosity, cs, 25C: 161
60F: 259

SOURCE: Texaco Chemical Co.: Formulas

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-102	20.0
C12 LAS	6.6
Triethanolamine	3.4
Ethanol	0
Sodium Xylene Sulfonate	2.0

Active, wt%: 30.0
Viscosity, cs, 25C: 138
60F: 262

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-85	12.9
C12 LAS	10.0
Triethanolamine	2.1
Ethanol	4.0

Active, wt%: 25.0
Viscosity, cs, 25C: 121
60F: 743

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-85	30.0
C13 LAS Conoco C-650	10.0
Triethanolamine	5.0
Ethanol	7.0

Active, wt %: 45.0
Viscosity, cs, 25C: 212

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-85	20.0
C13 LAS	10.0
Triethanolamine	5.0
Ethanol	7.0

Active, wt %: 35.0
Viscosity, cs, 25C: 184

SOURCE: Texaco Chemical Co.: Formulas

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-100	20.0
C12 LAS	6.6
Triethanolamine	3.4
Ethanol	0
Sodium Xylene Sulfonate	1.0

Active, wt%: 30.0
Viscosity, cs, 25C: 101
60F: 180

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-85	19.7
C12 LAS	10.0
Triethanolamine	3.3
Ethanol	0
Sodium Xylene Sulfonate	4.0

Active, wt%: 33.0
Viscosity, cs, 25C: 247
60F: 529

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-85	22.3
C12 LAS	10.0
Triethanolamine	3.7
Ethanol	0
Sodium Xylene Sulfonate	5.0

Active, wt %: 36.0
Viscosity, cs, 25C: 243
60F: 523

Liquid Detergent

Raw Materials:	% by Weight
Surfonic N-95	24.0
C12 LAS	8.0
Triethanolamine	4.0
Ethanol	0
Sodium Xylene Sulfonate	4.0

Active, wt%: 36.0
Viscosity, cs, 25C: 158
60F: 305

SOURCE: Texaco Chemical Co.: Formulas

Liquid Laundry Detergent

Ingredients:	% by Wt.
Water, D.I.	49.0
Stepanate SXS	5.0
Ethanol, 3A	4.0
Triethanolamine	2.0
Bio-Soft LD-190	40.0

Mixing Procedure:

Blend ingredients in order given. Add dye, perfume, and optical brighteners as desired.

Properties:

Appearance: Clear yellow liquid
Viscosity @ 25C, cps: 150
pH, as is: 9.0
Density, lbs/gal: 8.6

Use Instructions:

Use 1/4 cup per washload.

Comment:

Suggested optical brightener: Tinopal CBS-X manufactured by Ciba-Geigy.

Formulation No. 298

Liquid Laundry Detergent

Ingredients:	% by Wt.
Bio-Soft S-100	10.0
Sodium hydroxide (50%)	2.5
Alpha-Step ML-40	31.0
Neodol 25-7 or Makon 10	11.4
Tinopal CBS-X	0.2
Water	44.9

Mixing Procedure:

Charge tank with water and sodium hydroxide. Add Bio-Soft S-100 while mixing. Adjust pH to about 7 with sodium hydroxide or Bio-Soft S-100 as required. Add Tinopal CBS-X and dissolve. Add Alpha-Step ML-40 and Neodol 25-7 or Makon 10 in that order. Mix until clear and uniform. Add dye and fragrance as desired.

Properties:

Appearance: Clear yellow liquid
pH, as is: 8.0-9.0
Viscosity @ 25C, cps: 150-250
Solids, %: 35
Density, lbs/gal: 8.8

Use Instructions:

Use 1/4 to 1/2 cup per washload.

Performance:

The above formulation has been found to be similar in performaance and cost to commercially available products.

Comment:

Alpha-Step ML-40 is naturally derived and readily biodegradable. ML-40 acts as a lime soap dispersant, performs well in hard water, and also eliminates the need for additional hydrotrope or alcohol.

SOURCE: Stepan Co.: Formulation No. 465

Liquid Laundry Detergent

Ingredients:	% by Wt.
Makon 8	40.0
Triethanolamine (85%)	7.0
Bio-Soft S-100	8.0
3A alcohol	5.0
Tinopal CBS-X	0.2
Water, D.I.	39.8

Mixing Procedure:
Charge tank with warm water, disperse Tinopal CBS-X, add rest of the ingredients in the order shown above while under agitation. Mix until clear and uniform.

Properties:
Appearance: Clear, straw-colored liquid
pH, as is: 8.5
Viscosity @ 25C, cps: 275-325
Specific gravity: 1.02
Solids, %: 53-55

Use Instructions:
1/4 to 1/2 cup per load

Source: Stepan Co.: Formulation No. 204

Heavy Duty Liquid Laundry Detergent

Ingredients:	% wt/wt
Alkawet CF	17.0
Potassium hydroxide (45% sol'n.)	1.0
Sodium carbonate	10.0
RU Silicate	15.0
Water, dye, optical brightener	q.s. to 100.0

Preparative Procedure:
Charge the mixing vessel with all the water. Add the potassium hydroxide followed by the sodium carbonate and mix until in solution. When clear, add the RU Silicate and Alkawet CF. Continue to stir until a clear solution is obtained.

SOURCE: Lonza, Inc.: Formula C-99-90

Liquid Laundry Prespotter

Ingredients:	% by Wt.
Water, D.I.	54.2
Sodium tallow/coco (80:20) soap	4.0
Ninol 11-CM	2.5
Triethanolamine	2.0
Alpha-Step ML-40	37.3

Mixing Procedure:

Mix water and soap together at 90-100F. Add the remaining ingredients in the order given above, mixing thoroughly between each addition.

Properties:

Appearance: Clear yellow liquid
pH, as is: 9.5
Viscosity @ 25C, cps: 10
Solids, %: 23
Density, lbs/gal: 8.6
Freeze/thaw, 3 cycles: pass
Cold storage @ 4C. 1 week: pass

Use Instructions:

Spray directly on stain and let set 1 minute. Wash as usual.

Performance:

Cotton, polyester and 65/35 cotton/polyester swatches were stained with mustard, ketchup, tea, grape juice and chocolate. The above formulation removed the stains as well as a commercially available prespotter.

Comment:

The surfactants used in this formulation are derived from naturally occurring resources, e.g., coconut or palm kernel oil and tallow. They are readily biodegradable. This formulation does not contain any solvents.

Formulation No. 554

Laundry Prespotter

Ingredients:	% by Wt.
Makon 10	4.60
Bio-Soft D-62	3.25
Stepanol WA-Special	3.25
Triethanolamine	2.80
Butyl cellosolve	2.60
Water, D.I.	83.50

Mixing Procedure:

Mix water, butyl cellosolve, triethanolamine, and Stepanol WA-Special. With agitation, add Makon 10. Blend in Bio-Soft D-62. Mix until homogeneous.

Properties:

Appearance: Clear, colorless liquid
pH, as is: 10.0
Viscosity @ 25C, cps: 4

Use Instructions:

Spray direct from a hand pump-type sprayer.

Formulation No. 306

SOURCE: Stepan Co.: Formulations

Liquid Medium Duty All-Purpose Detergents

The following formulations can be easily prepared by adding the components in the order listed. Care should be taken to make sure the silicates are completely dissolved before adding the organic detergents and hydrotropes.

Formula #1:

Water	86.64%
Metso Anhydrous	6.00%
Monateric CEM-38	1.36%
Surfonic N-95	4.00%
Monamine ALX-100S	2.00%

Use Concentration: 1-4 oz/gal

This formulation has excellent wetting, detergent, rinsing and foaming properties. It is recommended as a medium duty cleaner for truck bodies, floor scrubs, wax strippers, etc. This product is clear from -5C to 70C. This formula would require approximately 4 times as much sodium xylene sulfonate as the amount of Monateric CEM-38 used to achieve clarity. Other nonionic ethoxylates, such as those based on primary alcohol or alkyl phenol may be substituted for the Surfonic N-95.

Formula #2:

Water	81.84%
Metso Anhydrous	4.50%
TKPP	9.00%
Monateric CEM-38	1.33%
Surfonic N-95	2.00%
NaLAS (100%)	1.33%

Use Concentration: 1-4 oz/gal

This formula contains TKPP as a partial replacement for the nonionic ethoxylate, and has excellent stability, detergency, and foaming properties.

Liquid Heavy Duty Detergent

Water	6.30%
KOH (45%)	6.70%
NaOH (50%)	6.00%
Sulframin 1298	2.00%
Monateric CEM-38	15.00%
N-Silicate	64.00%

Use Concentration: 1-4 oz/gal

This formulation is recommended as a steam cleaner, soak tank cleaner, high pressure cleaner or white wall tire cleaner.

SOURCE: Mona Industries, Inc.: MONATERIC CEM-38: Formulas

Low-Foam Powdered Laundry Detergent

Ingredients:	Wt Percent
Triton X-114	5 to 10.0
Sodium Tripolyphosphate	50
Sodium Sulfate	25 to 30.0
Sodium Carbonate	9.5
Sodium Silicate (SiO2/Na2O=2.4-2.6)	5.0
Sodium Carboxy Methyl Cellulose (Medium Viscosity)	0.5
Optical Brightener	Trace

SOURCE: Union Carbide Chemicals and Plastics Co., Inc.: Triton Nonionic Surfactant X-114: Formula

Handwash Laundry Detergent

Triton XL-80N Surfactant	5.3
Triton H-66 Surfactant (50%)	2.1
Sodium Alkylbenzene Sulfonate (60%), LAS	21.0
Fatty Acid Amide	3.2
Sodium Chloride	2.1
Fluorescent Whitener	0.1
Water	66.2

Formula OF#-193

Powdered Laundry Detergent

Triton XL-80N Surfactant	15.0
Sodium Carbonate/Soda Ash	50.0
Sodium Silicate	12.0
Sodium Sulfate	21.7
Carboxymethylcellulose, CMC	1.0
Fluorescent Whitening Agent	0.3

Formula OF#-58

SOURCE: Union Carbide Surfactants: Formulas

Liquid Detergent with Ammonia

	%
Sandopan DTC-100	20.00
Triethanolamine DDBSA	9.00
Ammonium Hydroxide (28%)	5.00
Water, dye	q.s.

SOURCE: Sandoz Chemicals: Sandopan Carboxylated Surfactants: Formula

Moderate Laundry Liquid-Built

Component:	wt.%
C-550 LAS	22.5
Alfonic 1412-60 Ethoxylate	15
Na Citrate	10
TEA	3
SXS	18
Dye, fragrance, optical brightener, water	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 90
Cloud/clear (F): 9/28
pH: 10

Order of Addition:
Water, Citrate, TEA, SXS, LAS, Nonionic

Moderate Laundry Liquid-Non-Built

Component:	wt.%
C-550 LAS	20
Alfonic 1412-60 Ethoxylate	30
Ethanol	10
TEA	5
Dye, fragrance, optical brightener, water	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 120
Cloud/clear (F): 36/38
pH: 10

Order of Addition:
Water, TEA, Ethanol, LAS, Nonionic

SOURCE: Vista Chemical Co.: Example Starting Formulations

Cold Water Wool Detergent

Ingredient:	Wt.%
Sodium Hexametaphosphate (1)	25.0
Sodium Tripolyphosphate (2)	10.0
Sodium Sulfate	29.5
Anionic Surfactant	20.0
CMC	0.5
Sodium Percarbonate (3)	15.0

(1) Monsanto Code 340
(2) Monsanto Code 101
(3) Riverside Products Proxycarb 135

SOURCE: Monsanto Co.: Sodium Hexametaphosphate: Formula

Non-Phosphate Dry-Blended Compact Laundry Powders
High Density-One Quarter Cup: High Quality

	%w
Neodol 23-6.5 (a)	13.0
Neodol 23-3 (a)	7.0
Zeolite A builder (b)	45.0
Sodium carbonate (c)	27.0
Sodium silicate (d)	6.0
CMC (e)	2.0
Fluoresecent whitening agent (f)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

High Density-One-Quarter Cup: Good Quality

	%w
Neodol 23-6.5 (a)	13.0
Neodol 23-3 (a)	7.0
Sodium carbonate (c)	73.0
Sodium silicate (d)	5.0
CMC (e)	2.0
Fluorescent whitening agent (f)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Dry Blending Procedure

The dry blending procedure that gives the best results in the laboratory with the nonionic surfactant-based high density laundry powders is the following:

1. Combine all dry components over a 1-2 minute time period while stirring in a Brabender Visco-Corder viscosimeter/paddle mixer.
2. Heat Neodol until single-phase liquid; dropwise, add warm nonionic to dry component mixture, stirring until nonionic is evenly adsorbed onto dry component beads.

Note:

If desired, enzymes (e.g., 0.75%w) can be included in these formulas. Protease and/or amylase enzymes made by Novo Industries, IBIS, Miles Laboratories, or any other equivalent source can be used. Enzymes should be added after the surfactant is adsorbed.

(a) The combination of Neodol 23-6.5 and Neodol 23-3 may be replaced with Neodol 23-5.
(b) Valfor 100, PQ Corp., or equivalent product.
(c) Light density soda ash, Snowlite JG, Neos Chemical, Tronalight, Kerr-McGee Chemical may be used, or equivalent product.
(d) Sodium Silicate G or Britesil H2O, PQ Corp., or equivalent product may be used.
(e) Carboxymethylcellulose.
(f) A fluorescent whitening agent should also be included (0.1-0.3%w).

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations:

Non-Phosphate Dry-Blended Compact Laundry Powders
High Density-One-Half Cup: High Quality

	%w
Neodol 25-7	10.0
Zeolite A builder (a)	34.0
Sodium carbonate (b)	34.0
Sodium silicate (c)	3.0
Sodium sulfate	18.0
CMC (d)	1.0
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Good Quality

	%w
Neodol 25-7	10.0
Sodium carbonate (b)	68.0
Sodium silicate (c)	3.0
Sodium sulfate	18.0
CMC (d)	1.0
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Economy

	%w
Neodol 25-7	10.0
Sodium carbonate (b)	46.0
Sodium silicate (c)	3.0
Sodium sulfate	40.0
CMC (d)	1.0
Fluorescent whitening agent (e)	as desired

Properties:
Powder density, gm/cc: 0.6-0.8

Dry Blending Procedure:
The dry blending procedure that gives the best results in the laboratory with the nonionic surfactant-based high density laundry powders is the following:

1. Combine all dry components over a 1-2 minute time period while stirring in Brabender Visco-Corder viscosimeter/paddle mixer.
2. Heat Neodol until single-phase liquid; drop-wise, add warm nonionic to dry component mixture, stirring until nonionic is evenly adsorbed onto dry component beads.

Note: If desired, enzymes (e.g., 0.75%w) can be included in these formulas. Protease and/or amylase enzymes made by Novo Industries, IBIS, Miles Laboratories, or any other equivalent source can be used. Enzymes should be added after the surfactant is adsorbed.

(a) Valfor 100, PQ Corp., or equivalent product. (b) Light density soda ash, Snowlite JG, Neos Chemical, Tronalight, Kerr-McGee Chemical may be used, or equivalent product. (c) Sodium silicate G or Britesil H2O, PQ Corp., or equivalent product may be used. (d) Carboxymethylcellulose (e) A fluorescent whitening agent should also be included (0.1-0.3%w).

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Non-Phosphate Laundry Powder

Ingredient:	Wt% (Active)
Neodol 25-7	8%
Experimental Surfactant XDS 40341	2%*
Zeolite 4A	34%
Sodium Carbonate	34%
Sodium Silicate	3%
Sodium Sulfate	18%
CMC	1%

Combine all dry ingredients over 1-2 minutes while stirring using a paddle-type mixer. Heat Neodol surfactant until it is a single-phase liquid; add the warm Neodol surfactant dropwise to the dry ingredients, stirring until evenly mixed.

* This experimental surfactant is a 95% active, dry form of hexadecyldiphenyloxide disulfonate. It is available from The Dow Chemical Co.

Unbuilt Heavy Duty Laundry Formulation

Ingredient:	Wt% (Active)
Dowfax 8390	3-5%
Neodol 25-6.5	25-27%
Triethanolamine	5%
Ethanol	5%
KCl	2%
Water, perfumes, optical brighteners, dye	q.s.

Add the KCl to the water. Add ethanol and triethanolamine. Add Dowfax 8390, noting that the material is 35% active. Add the Neodol 25-6.5. Add optical brighteners, perfumes and dyes as needed.

SOURCE: Dow Chemical Co.: Industrial Laundry Data Package: Formulas

Gelled Laundry Detergent

The suggested formulation for this product is as listed below:

Material:	Weight %
Deionize H2O	39.0
Korthix H	4.0
Sodium Myreth Sulfate	45.0
Cocamide Propylamine Oxide	7.0
Cocamide Propylbetaine	5.0

SOURCE: Kaopolite, Inc.: Formula

Non-Phosphate Laundry Powder

Raw Materials:	% by Weight
Surfonic L24-7	10
Sodium carbonate	68
Sodium silicate	3
Sodium sulfate	18
Carboxymethylcellulose or Sodium Polyacrylate	1
Fluorescent whitening agent	as desired (0.1-0.3)

Non-Phosphate Highly Alkaline Liquid Laundry Detergent

Raw Materials:	% by Weight
Surfonic L24-9	3.0
Sodium metasilicate, pentahydrate	11.9
Potassium hydroxide (45%)	6.1
Potassium carbonate	3.4
Carboxymethylcellulose	1.0
Phosphate ester coupling agent**	5.0
Water, dye, perfume, fluorescent whitening agent	to 100%

** e.g., Triton H-66

Non-Phosphate Liquid Laundry Detergent

Raw Materials:	% by Weight
Surfonic L24-7	30.0
C12 LAS (60%)	16.7
Triethanolamine	3.0
Ethanol SD-3A	5.5
Potassium chloride	1.0
Fluorescent whitening agent	0.3-0.5
Water, dye, perfume	to 100%

Blending Procedure:

Blend at slightly above room temperature (80-90F). Stir continuously during addition of ingredients until each ingredient is in solution before adding the next.

SOURCE: Texaco Chemical Co.: Formulas

One-Half Cup Built Laundry Liquids(a)
High Quality(b)

	%w
Neodol 25-9 (c)	6.0
Neodol 25-3S (60%)	30.0
Coconut fatty acid	2.0
Monoethanolamine	2.0
Citric acid, anhydrous	8.0
Sodium hydroxide (50%)	8.2
Sodium xylene sulfonate (40%)	5.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 116
- Clear point, F: 34
- Temperature stability 140F for 1 week: pass
- Freeze-thaw test (3 cycles): pass
- pH: 8.6

High Quality

	%w
Neodol 25-9 (c)	6.0
Neodol 25-3S (60%)	20.0
C12LAS (60%) (d)	10.0
Coconut fatty acid	2.0
Monoethanolamine	2.0
Citric acid, anhydrous	8.0
Sodium hydroxide (50%)	8.2
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 160
- Clear point, F: 32
- Temperature stability 140F for 1 week: pass
- Freeze-thaw test (3 cycles): pass
- pH: 8.6

(a) If desired, enzymes (e.g., 1.0%w) can be included in these formulas. Protease and/or amylase enzymes made by Novo Industries, IBIS, Miles Laboratories or any other equivalent source can be used.
(b) Neodol 25-3S provides better enzyme stability than C12LAS.
(c) May substitute with Neodol 25-7 or Neodol 23-6.5.
(d) Witconate 1260, Witco Corp., Bio-Soft D-62, Stepan Co., or any equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

One-Half Cup Built Laundry Liquids(a)
High Quality, High Foam

	%w
Neodol 25-9 (c)	6.0
Neodol 25-3S (60%)	20.0
C12LAS (60%) (d)	10.0
Monoethanolamine	2.0
Citric acid, anhydrous	8.0
Sodium hydroxide (50%)	7.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:

Viscosity, 73F, cps: 145
Clear point, F: 30
Temperature stability 140F for 1 week: pass
Freeze-thaw test (3 cycles): pass
pH: 8.8

(a) If desired, enzymes (e.g., 1.0%w) can be included in these formulas. Protease and/or amylase enzymes made by Novo Industries, IBIS, Miles Laboratories or any other equivalent source can be used.
(b) Neodol 25-3S provides better enzyme stability than C12LAS.
(c) May substitute with Neodol 25-7 or Neodol 23-6.5.
(d) Witconate 1260, Witco Corp., Bio-Soft D-62, Stepan Co., or any equivalent product.

Blending Procedure:

For the preparation of clear-type, HDL formulations, the order of addition is of importance to minimize viscosity resistance to mixing and to avoid possible gel formation. Effective stirring should be maintained during addition of all ingredients, and each ingredient should be in solution before the next is added. A blending temperature somewhat above ambient (e.g., 80-90F) is recommended but not essential.

1. Put the water into the mixing vessel and add the monoethanolamine.
2. Add the linear alkylbenzene sodium sulfonate (LAS), when indicated, followed by the Neodol 25-3S.
3. Add the Neodol 25-9 with efficient stirring.
4. Add the coconut fatty acid when indicated, and the citric acid, followed by the sodium hydroxide. The pH of the solution should be approximately 8.5.
5. If enzymes are used, add at this point.
6. Add the fluorescent whitening agent(s) with rapid stirring.
7. Add perfume and dye as needed to give the desired odor and color.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

One-Half Cup Laundry Liquids with Fabric Softener

Premium Quality

	%w
Neodol 25-9	26.0
C12LAS (60%) (a)	6.7
Softener (b)	6.0
Triethanolamine	5.0
Potassium chloride	1.0-2.0
Ethanol	9.0-10.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
Viscosity, 73F, cps: 110
Clear point, F: 41

Premium Quality (c)

	%w
Neodol 25-9	30.0
Softener (b)	6.0
Triethanolamine	5.0
Ethanol	10.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
Viscosity, 73F, cps: 180
Clear point, F: 63

Good Quality

	%w
Neodol 25-9	21.3
C12LAS (60%) (a)	4.5
Softener (b)	4.0
Triethanolamine	3.0
Potassium chloride	2.0-3.0
Ethanol	11.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
Viscosity, 73F, cps: 70
Clear point, F: 50

(a) Witconate 1260, Witco Corp., or equivalent product.
(b) Cationic surfactant used as 75% active matter in an ethanolic solution. Armosoft WA104, from Akzo Chemie America, or any equivalent product can be used.
(c) This formula is moderately superior for removing mixed sebum soils, but somewhat less effective against oily soils and for preventing soil redeposition.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

One-Half Cup Laundry Liquids with Fabric Softener(Continued)
Good Quality (c)

	%w
Neodol 25-9	24.0
Softener (b)	5.0
Triethanolamine	3.0
Ethanol	10.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
Viscosity, 73F, cps: 80
Clear point, F: 63

(b) Cationic surfactant used as 75% active matter in an ethanolic solution. Armosoft WA104, from Akzo Chemie America, or any equivalent product can be used.

Blending Procedure:
For the preparation of unbuilt, clear-type, HDL formulations, the order of addition is of importance to minimize viscosity resistance to mixing and to avoid possible gel formation. Effective stirring should be maintained during addition of all ingredients, and each ingredient should be in solution before the next is added. A blending temperature somewhat above ambient (e.g., 80-90F) is recommended but not essential.

1. Put the water, ethanol and potassium chloride into the mixing vessel and add the triethanolamine.
2. Add the Neodol 25-9 with efficient stirring.
3. Add the softener with efficient stirring.
4. Add linear alkylbenzene sodium sulfonate (LAS), when indicated, and mix thoroughly.
5. Add the fluorescent whitening agent(s) with rapid stirring.
6. Add perfume and dye as needed to give the desired odor and color.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

One-Quarter Cup Unbuilt Laundry Liquid
Regular Quality

	%w
Neodol 25-7	22.5
C12LAS (60%) (a)	12.5
Triethanolamine	3.0
Ethanol SD-3A	5.0
Potassium chloride	2.0
Fluorescent whitening agent(s)	0.3-0.4
Water, dye, perfume	to 100%

Properties:

Active matter, %w: 30
Viscosity, 73F, cps: 140
Clear point, F: 48
Pour point, F: 21
pH: 10.5

(a) Witconate 1260, Witco Corp., Bio-Soft D-62, Stepan Co., or any other equivalent product may be used.

Blending Procedure:

For the preparation of unbuilt, clear-type, HDL formulations, the order of addition is of importance to minimize viscosity resistance to mixing and to avoid possible gel formation. Effective stirring should be maintained during addition of all ingredients, and each ingredient should be in solution before the next is added. A blending temperature somewhat above ambient (e.g., 80-90F) is recommended but not essential.

1. Put the water into the mixing vessel and add the potassium chloride.
2. Add the ethanol and triethanolamine.
3. Add the linear alkylbenzene sodium sulfonate (LAS) slurry, if indicated.
4. Add the Neodol alcohol ethoxylate. Be sure to have efficient stirring, and if feasible, add it near the vortex of the stirrer.
5. Add the Neodol 25-3S slowly with stirring, where indicated.
6. Add the fluorescent whitening agent with rapid stirring.
7. Add perfume and dye as needed to give the desired odor and color.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

One-Quarter Cup Unbuilt Laundry Liquids
Super Premium Quality

	%w
Neodol 25-7	37.5
C12LAS (60%) (a)	20.8
Triethanolamine	3.0
Ethanol SD-3A	6.0
Potassium chloride	1.0
Fluorescent whitening agent(s)	0.3-0.5
Water, dye, perfume	to 100%

Properties:

- Active matter, %w: 50
- Viscosity, 73F, cps: 135
- Clear point, F: 54
- Pour point, F: 5
- pH: 10.5

Premium Quality

	%w
Neodol 25-7	32.0
Neodol 25-3S (60%)	13.3
Triethanolamine	3.0
Ethanol SD-3A	5.0
Potassium chloride	4.0
Fluorescent whitening agent(s)	0.3-0.5
Water, dye, perfume	to 100%

Properties:

- Active matter, %w: 40
- Viscosity, 73F, cps: 185
- Clear point, F: 45
- Pour point, F: 25
- pH: 9.2

Premium Quality

	%w
Neodol 25-7	30.0
C12LAS (60%) (a)	16.7
Triethanolamine	3.0
Ethanol SD-3A	5.5
Potassium chloride	1.0
Fluorescent whitening agent(s)	0.3-0.5
Water, dye, perfume	to 100%

Properties:

- Active matter, %w: 40
- Viscosity, 73F, cps: 175
- Clear point, F: 27
- Pour point, F: 13
- pH: 10.4

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Powdered Laundry Detergent

Ingredients:	% by Wt.
Nacconol 90G	15.70
Soda ash, anhydrous	39.00
Sodium sesquicarbonate	8.70
Sodium polysilicate	7.80
Sodium sulfate	22.70
Carboxymethylcellulose	1.00
Tinopal AMS	0.20
Tinopal RBS-200	0.05
Zeolex 23A	1.95
Makon 10	2.90

Mixing Procedure:

Combine first eight ingredients and mix to a homogeneous powder. Atomize the Makon 10 slowly into the powder while mixing. Screen product through a 12 mesh sieve and return to blender. Add Zeolex 23A and mix until uniform.

Properties:

Appearance: White free-flowing powder
pH, 1% soln: 10.6
Density, lbs/gal: 6.0

Use Instructions:

Use 1/2 cup per washload

Comment:

This blended non-phosphate product is well-suited for use in hard as well as soft water.

SOURCE: Stepan Co.: Formulation No. 472

Laundry Detergent-Linen Supply (Powder, Medium Alkalinity)

Soil: Acid food fat, oil and grease; blood, sebum and body waste
Surface: Cotton and cotton/polyester
Application Method: Industrial washing machine
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Sodium Carbonate	30.0
STPP	20.0
*Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	8.0
Sodium Sulfate	6.0
**Sodium Alkylaryl Sulfonate Powder (90%)	4.0
Metso Beads 2048	30.0
Carboxymethylcellulose	2.0

Use Dilution:
Light Soil: 0.25% by weight or 1 lb per 100 lbs laundry
Medium to Heavy Soil: 0.25%-0.50% by weight or 1-2 lbs per 100 lbs laundry
* Rohm & Haas, Union Carbide, GAF
** Stepan, Witco

SOURCE: The PQ Corp.: PQ Formulary: Formula

Premium Laundry Liquid (Non-Built)

Component:	wt.%
C-550 LAS	40
Alfonic 1412-60 Ethoxylate	20
Ethanol	4
TEA	5
Dye, fragrance, optical brightener, water	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
- Viscosity (cps) (25C): 200
- Cloud/clear (F): 7/22
- pH: 10

Order of Addition:
Water, TEA, Ethanol, LAS, Nonionic

Premium Laundry Liquid (Built)

Component:	wt.%
C-550 LAS	40
Alfonic 1412-60 Ethoxylate	10
Na Citrate	10
TEA	3
SXS	12
Dye, fragrance, optical brightener, water	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
- Viscosity (cps) (25C): 135
- Cloud/clear (F): 9/22
- pH: 10

Order of Addition:
Water, Citrate, TEA, SXS, LAS, Nonionic

Laundry Liquid With Fabric Softener

Component:	wt. %
Alfonic 1412-60 Ethoxylate	21
Quaternary*	3
Ethanol	16
Dye, fragrance, optical brightener, water	q.s.

*Ditallow dimethyl ammonium chloride

Properties:
- Approximate pH: 10.0
- Cloud/clear (F): 50/62
- Viscosity (cps) (25C): 185

Order of Addition:
Water, Ethanol, Quaternary, Nonionic

SOURCE: Vista Chemical Co.: Example Starting Formulations

Pump Spray Prespotters-Water-Based

Good Quality

	%w
Neodol 25-7 (a)	9.75
Neodol 25-3 (a)	5.25
Sodium xylene sulfonate (40%)	15.00
EDTA (b) salt	0.50
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 18
Clear point, F: 59

Regular Quality

	%w
Neodol 25-7 (a)	6.5
Neodol 25-3 (a)	3.5
Sodium xylene sulfonate (40%)	12.5
EDTA (b) salt	0.5
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 11
Clear point, F: 62

Economy

	%w
Neodol 25-7 (a)	5.2
Neodol 25-3 (a)	2.8
Sodium xylene sulfonate (40%)	8.75
EDTA (b) salt	0.5
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 19
Clear point, F: 62

Blending Procedure:

To minimize the possibility of gel formation, and subsequent slow solution, the formulations should be prepared as follows:

1. Load the two Neodols into the vessel and mix.
2. Add the sodium xylene sulfonate solution and mix.
3. Add the water and EDTA salt, either premixed or in that order.
4. Mix until homogeneous.

Heating the water and/or Neodols to 100-120F before addition will facilitate solution, but is not essential.

(a) The combination of Neodol 25-7 and Neodol 25-3 may be replaced with Neodol 23-5; adjust SXS as needed for stability.
(b) Ethylenediamine tetraacetic acid or similar compound.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Rinse-Added Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	92.4
Accosoft 540	7.6

Mixing Procedure:
Charge water. Heat Accosoft 540 to approximately 100F to melt. Slowly add Accosoft 540 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:
Appearance: Opaque liquid
pH, as is: 6.0 typical
Viscosity @ 25C, cps: 240
Visc @ 50C 4 weeks, cps: 500
Visc after freeze/thaw, cps: 1600
Solids, %: 6.5

Use Instructions:
Use 1/3 cup in the rinse cycle per normal wash load.

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 370

So/San Commercial Fabric Softener Sanitizer

Ingredients:	% by Wt.
Water	75.0
SO/SAN 30M (26% Active) EPA Reg. No. 1839-57	25.0

Mixing Procedure:
Charge vessel with water and add SO/SAN 30M while mixing until homogeneous. Solution can be slightly hazy.

Properties:
Appearance: Clear to slightly hazy liquid
pH, as is: 4.5
Density, lbs/gal: 8.34
Viscosity @ 25C: Water thin

Use Instructions:
Add 5 oz. Fabric Softener Sanitizer per 100 lbs. of dry laundry in the final rinse cycle.
For complete use instructions, see product label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
EPA Registration Number 1839-108

SOURCE: Stepan Co.: Formulation No. 327

Softener/Sour

Ingredients:	% by Wt.
Water, D.I.	88.0
Accosoft 550 HC	4.0
Ammonium bifluoride	6.0
BTC 99	2.0

Mixing Procedure:
Add Accosoft 550 HC to warm water. Carefully add the ammonium bifluoride while mixing. Add the BTC 99 and mix until homogeneous.

Properties:
Appearance @ 25C: Translucent liquid
pH, as is: 5.4-5.6
Viscosity @ 25C, cps: <100
Solids, %: 8.0
Freeze/thaw, 1 cycle: Pass
Appearance after 3 days @ 50C: No separation
Appearance after 5 months @ 25C: Pearlized liquid

Use Instructions:
Use 25 ounces per 100 lbs. of dry laundry.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 193

Softener/Sour

Ingredients:	% by Wt.
Water, D.I.	75.6
Phosphoric Acid	17.7
Accosoft 550L-90	6.7

Mixing Procedure:
Charge water. Slowly add Accosoft 550L-90 to water while mixing. Carefully add phosphoric acid and mix until homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: <1
Viscosity @ 25C, cps: 5
Visc after 4 wks @ 50C, cps: 20
Visc after freeze/thaw, cps: 100
Solids, %: 21.0

Use Instructions:
Use 15 ounces per 100 lbs of dry fabric.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 447

Softener/Sour

Ingredients:	% By Wt.
Water, D.I.	55.7
Hydroxyacetic Acid (70%)	34.3
Accosoft 808	10.0

Mixing Procedure:
Charge water. Slowly add Accosoft 808 to water while mixing. Add hydroxyacetic acid and mix until homogeneous.
Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 1.45
Viscosity @ 25C, cps: 325
Visc after 4 wks @ 50C, cps: Separated
Visc after freeze/thaw, cps: 320
Solids, %: 32.0
Use Instructions:
Use 10 ounces per 100 lbs of dry fabric.
Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric. Hydroxyacetic acid is also known as glycolic acid.
Formulation No. 448

Softener/Sour

Ingredients:	% by Wt.
Water, D.I.	48.6
Accosoft 550 HC	11.4
Phosphoric acid	40.0

Mixing Procedure:
Disperse the Accosoft 550 HC into the water. Slowly add phosphoric acid while mixing until product is homogeneous.
Properties:
Appearance @ 25C: Opaque liquid
pH, as is: <1.0
Viscosity @ 25C, cps: 35
Solids, %: 44.0
Appearance after 2 weeks @ 5C: No separation
Appearance after 1 week @ 50C: No separation
Use Instructions:
Use 10 ounces per 100 lbs. of dry laundry.
Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 462

Softener/Sour

Ingredients:	% by Wt.
Water, D.I.	61.4
Accosoft 808	8.6
Hydroxyacetic acid (70%)	30.0

Mixing Procedure:
Disperse Accosoft 808 into water. Slowly add the hydroxyacetic acid while mixing until product is homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 1.5-2.0
Viscosity @ 25C, cps: <100
Solids, %: 27.9
Freeze/thaw, 1 cycle: Pass
Appearance after 2 weeks @ 50C: No separation

Use Instructions:
Use 12 ounces per 100 lbs. of dry laundry.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric. Hydroxyacetic acid is also known as glycolic acid.
Formulation No. 463

Softener/Sour

Ingredients:	% by Wt.
Water, D.I.	61.0
Accosoft 550 HC	9.0
Hydroxyacetic acid (70%)	30.0

Mixing Procedure:
Disperse Accosoft 550 HC into water. Slowly add the hydroxyacetic acid while mixing until product is homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 1.5-2.0
Viscosity @ 25C, cps: <100
Solids, %: 28.9
Freeze/thaw, 1 cycle: Pass
Appearance after 2 weeks @ 50C: No separation

Use Instructions:
Use 12 ounces per 100 lbs. of dry laundry.

Comment:
Hydroxyacetic acid is also known as glycolic acid. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 483

Softener/Sour

Ingredients:	% by Wt.
Water, D.I.	61.4
Accosoft 808	8.6
Phosphoric acid	30.0

Mixing Procedure:
Disperse the Accosoft 808 into the water. Slowly add phosphoric acid while mixing until product is homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: <1.5
Viscosity @ 25C, cps: <50
Solids, %: 32.4
Appearance after 2 wks @ 50C: No separation
Appearance after 5 mon @ 25C: No separation

Use Instructions:
Use 12 ounces per 100 lbs. of dry laundry.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 490

Softener/Sour

Ingredients:	% By Wt.
Water, D.I.	48.6
Accosoft 808	11.4
Phosphoric acid	40.0

Mixing Procedure:
Disperse the Accosoft 808 into the water. Slowly add phosphoric acid while mixing until product is homogeneous.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: <1.0
Viscosity @ 25C, cps: 50
Solids, %: 43.1
Appearance after 3 days @ 50C: No separation
Freeze/thaw, 1 cycle: Pass

Use Instructions:
Use 10 ounces per 100 lbs. of dry laundry.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 493

SO/SAN Household Fabric Softener Sanitizer

Ingredients:	% by Wt.
Water	93.75
SO/SAN 30M (26% Active) EPA Reg. No. 1839-57	6.25

Mixing Procedure:
Charge vessel with water and add SO/SAN 30M while mixing until homogeneous.

Properties:
Appearance: Slightly hazy liquid
pH, as is: 4.5
Density (lbs/gal): 8.50
Viscosity @ 25C: Water thin

Use Instructions:
Add 2 ozs. of product per 10 lbs. of dry laundry in the final rinse cycle.
For complete use instructions, see EPA Registered Label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-107

Fabric Softener

Ingredients:	% by Wt.
Water, D.I.	90.9
Accosoft 550L-90	9.1

Mixing Procedure:
Charge water. Slowly add Accosoft 550L-90 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:
Appearance @ 25C: Opaque liquid
pH, as is: 4.0-6.0
Viscosity @ 25C, cps: 160
Visc after 4 weeks @ 50C, cps: 310
Visc after freeze/thaw, cps: 1600
Solids, %: 8.0
Density, lbs/gal: 8.34

Use Instructions:
Use 1/4 cup in rinse cycle per normal wash load.

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co. Formulation No. 26

5% BTC 2125M Powdered Fabric Softener/Sanitizer

Ingredients:		% by Wt.
BTC 2125M P40 (40% Active)	EPA Reg. No. 1839-55	12.5
Arosurf TA-100		5.0
Urea		82.5

Mixing Procedure:
Follow standard manufacturing procedures for dry blended products. Charge mixer with urea and add remaining ingredients in order shown. Mix until homogeneous.

Properties:
Appearance: White, free-flowing powder
pH, 1% aqueous: 7.0
Density, g/ml: 0.713

Use Instruction:
Add 8 ozs. per 100 lbs. of dry laundry in the final rinse cycle.
For complete use instructions, see EPA Registered Label

Storage Stability:
Store in a cool dry place. Keep lid closed to prevent caking. Formulation is stable at 120F for 30 days.

Comment:
EPA Registration Number 1839-111
Formulation No. 94

Softener/Sour

Ingredients:	% by Wt.
Water, D.I.	44.2
Makon NF-5	2.0
Accosoft 808	13.8
Citric acid, anhydrous	40.0

Mixing Procedure:
Disperse the Makon NF-5 into warm water. Slowly add the Accosoft 808 until completely dispersed. Add citric acid and mix until homogeneous.

Properties:
Appearance @ 25C: Translucent liquid
pH, as is: <2.0
Viscosity @ 25C, cps: <100
Solids, %: 53.0
Appearance after 2 weeks @ 50C: Slight separation
Appearance after 2 weeks @ 25C: No separation
Freeze/thaw, 1 cycle: Pass

Use Instructions:
Use 8 ounces per 100 lbs. of dry laundry.

Comment:
Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.

SOURCE: Stepan Co.: Formulation No. 496

20% BTC 2125M Powdered Fabric Softener Sanitizer

Ingredients:	% By Wt.
BTC 2125M P40 (40% Active) EPA Reg. No. 1839-55	50.0
Arosurf TA-100	20.0
Urea	30.0

Mixing Procedure:
Follow standard manufacturing procedures for dry blended products. Charge mixer with urea and add remaining ingredients in order shown. Mix until homogeneous.

Properties:
Appearance: White, free-flowing powder
pH, 1% aqueous: 7.0
Density, g/ml: 0.648

Use Instructions:
Add 2 ozs. per 100 lbs. of dry laundry in the final rinse.
For complete use instructions, see EPA registered label.

Storage Stability:
Store in a cool dry place. Keep lid closed to prevent caking. Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Department for subregistration package.
EPA Registration Number 1839-110
Formulation No. 97

Economy Fabric Softener

Ingredients:	% By Wt.
Water, D.I.	97.1
Accosoft 540	2.9

Mixing Procedure:
Charge water. Heat Accosoft 540 to approximately 100F to melt. Slowly add Accosoft 540 to water while mixing. Adjust pH as desired with sulfuric acid or sodium hydroxide.

Properties:
Appearance: Opaque liquid
pH, as is: 6.0 typical
Viscosity @ 25C, cps: 10
Visc @ 50C 4 weeks, cps: 10
Visc after freeze/thaw, cps: 25
Solids, %: 2.5

Use Instructions:
Use 1/2 cup in rinse cycle per normal wash load.

Comment:
The final viscosity of a liquid fabric softener depends on temperature, mixing rate and pH. The viscosities listed above are those obtained in the lab. Calcium chloride can be used to reduce viscosity. Fabric softeners made with an Accosoft product are non-yellowing, control static and maintain rewet properties of the fabric.
Formulation No. 30

SOURCE: Stepan Co.: Formulations

9. Metal Cleaners

Acid Cleaner, Iron and Steel, Soak or Spray

Ingredient:	Weight %
Phosphoric Acid, 75%	65
Butyl Cellosolve	10
Water	25

Use Level: 2-3 oz/gal Spray
6-8 oz/gal Soak
Suggested Temperature: 140-160F

Acid Cleaner, Aluminum, Soak or Spray

Ingredient:	Weight %
Phosphoric Acid, 75%	20-50
Triton N-101	4
Citric Acid, 50%	5-10
Butyl Cellosolve	5-15
Water	Balance

Use Level: 2-3 oz./gal Spray
6-8 oz./gal Soak
Suggested Temperature: 140-160F

Powdered Acid Cleaner

Ingredient:	Weight %
Monosodium Phosphate (MSP)	44.5
Sodium Acid Sulfate	45
Calsoft F-90	10
Sodium Bichromate	0.5

Use Level: 2-4 oz/gal

SOURCE: Monsanto Co.: Metal Treating: Formulas

Acid Aluminum Cleaner

	%
Nonionic surfactant (1)	2
Phosphoric Acid, 85%	3
Citric Acid	4
Methyl ethyl ketone (MEK)	3
Water	88

Apply with sponge, soft brush or rag. Leave on surface no longer than 15 minutes. Rinse with water.

(1) Triton X-100 or N-101

SOURCE: Monsanto Co.: Acid Cleaners: Formula

Acid Cleaner (Powder Form)

	%
Monosodium Phosphate*	93.8
Butyl cellosolve	2.0
Nonionic Surfactant**	2.0
Nickel Carbonate	0.2
Sodium Nitrite	2.0

Use concentration 2-8 oz./gallon [16-65 g./l.]
* Can be a mixture of Monosodium Phosphate and Sodium Acid Pyrophosphate; Monsanto Co.
** Triton X-100 or N-101; Union Carbide Co.

Acid Cleaner (Powder Form)

	%
Monosodium Phosphate*	96.0
Butyl Cellosolve	2.0
Nonionic Surfactant**	2.0

Use Concentrations 2-8 oz./gallon [16-65 g./l]
* Monsanto Co. Can be a mixture of Sodium Acid Pyrophosphate and Monosodium Phosphate.
** Triton X-100 or N-101, Union Carbide Co.

Thickened Phosphoric Acid: Formula 1

	%
Phosphoric Acid, 85% (1)	25.0
Kelzan (xanthan gum)	1.0
Water	74.0

Viscosity, cps.: 5000

Thickened Phosphoric Acid: Formula 2

	%
Phosphoric Acid, 85% (1)	25.0
Kelzan (xanthan gum)	2.0
Water	73.0

Viscosity, cps: 12,500

(1) Monsanto Co.

SOURCE: Monsanto Co.: Acid Cleaners: Formulas

Acid Metal Cleaner

Ingredients:	Percent by Weight
Part A:	
1) Korthix H	0.8
2) Kelzan	0.4
3) Water	72.1
Part B:	
4) Hampene 100	0.9
5) Monazoline Cy	0.8
6) Phosphoric acid (86%)	15.0
7) Kaopolite SF or 1168	10.0

Procedure:

Add the Korthix H (1) and Kelzan (2) to the water slowly, agitating continually until smooth. Add Part B ingredients to Part A in order, mixing after the addition of each until smooth and uniform. Avoid incorporation of air.

High-Luster Copper Cleaner

Ingredients:	Percent by Weight
1) Deionized water	25.
2) Kaopolite SF or 1168	20.
3) Deionized water	43.4
4) Ammonium hydroxide, 26-degree	3.5
5) Thioglycolic acid, 70%	6.
6) Dowfax 2AO	2.

Procedure:

Add (2) slowly to (1) with vigorous agitation, continuing until well disintegrated and smooth. Reduce agitation to moderate, add (3) through (6) in succession, stirring until thoroughly blended. Add more (4), if needed, to bring final pH to 7.0.

Comment:

Mixture will generate persistent foam during transfer, filling or the like handling. Colloid 581-B has been found useful for controlling the foam.

SOURCE: Kaopolite, Inc.: Formulas

Alkaline Cleaner, Aluminum, Soak

Ingredient:	Weight %
Tetrasodium Pyrophosphate	30
Sodium Metasilicate Pentahydrate	30
Soda Ash	20
Trisodium Phosphate (1)	17
Triton N-101	3

(1) Monsanto Co.
Use Level: 4 oz./gal
Suggested Temperature: 160F

Alkaline Cleaner, Aluminum, Spray

Ingredient:	Weight %
Caustic Soda, 50%	4
Trisodium Phosphate (1)	2
Dequest 2000, 50% (1)	2
Gluconic Acid, 50%	2
Triton N-101	0.5
Water	Balance

(1) Monsanto Co.
Use Level: As Is
Suggested Temperature: 160F

Aluminum Etching Bath

Ingredient:	Weight %
Dequest 2010, 60% (1)	0.15
Caustic Soda, 50%	7
Soda Ash	1
Sodium Gluconate	0.15
Trisodium Phosphate Crystalline (1)	0.5
Water	Balance

(1) Monsanto Co.
Use Level: As Is
Suggested Temperature: 140-180F

Aluminum Bright-Dip Bath

Ingredient:	Weight %
NFB 85 Phosphoric Acid (1)	82
Nitric Acid, 70%	4.3
Water	13.7

(1) Monsanto Co.
Temperature: 190-210F
Dip Time: 1-3 minutes

SOURCE: Monsanto Co.: Metal Treating: Formulas

Alkaline Cleaner, Iron & Steel, Soak

Ingredient:	Weight %
Tetrasodium Pyrophosphate	20
Sodium Metasilicate Pentahydrate	20
Soda Ash	53
Sodium Gluconate	5
Triton N-101	2

Use Level: 6-8 oz/gal.
Suggested Temperature: 180-200F

Alkaline Cleaner, Iron & Steel, Soak

Ingredient:	Weight %
Sodium Tripolyphosphate	20
Soda Ash	18
Caustic Soda	20
Sodium Metasilicate, Anhydrous	30
Sodium Resinate	5
Calsoft F-100	5
Neodol 25-7	2

Use Level: 8 oz./gal
Suggested Temperature: 180-200F

Alkaline Cleaner, Iron & Steel, Spray

Ingredient:	Weight %
Caustic Soda	20
Soda Ash	29
Sodium Tripolyphosphate	20
Sodium Metasilicate, Anhydrous	30
Triton N-101	1

Use Level: 1-2 oz/gal
Suggested Temperature: 170F

Zinc Phosphating-Immersion

Ingredient:	Weight %
Phosphoric Acid, 75%	31.1
Nitric Acid, 42	5.2
Water	40.0
Zinc Oxide	5.9
Calcium Nitrate	17.8

Use Level: 2-3% by volume
Suggested Temperature: 165F

SOURCE: Monsanto Co.: Metal Treating: Formulas

Alkaline Metal Cleaners

High Quality

	%w
Neodol 91-6	10.0
Sodium metasilicate, pentahydrate	7.0
Trisodium phosphate, anhydrous basis	2.0
Sodium hydroxide (50%)	3.0
EDTA (a)	6.0
Phosphate ester (b)	5.0
Water	to 100%

Properties:
- Viscosity, 73F, cps: 28
- Phase coalescence temp., F: 99
- pH: 12.7

Good Quality

	%w
Neodol 91-6	7.5
Sodium metasilicate, pentahydrate	15.6
EDTA (a)	1.0
Phosphate ester (b)	8.0
Water	to 100%

Properties:
- Viscosity, 73F, cps: 12
- Phase coalescence temp., F: 135
- pH: 13.2

Blending Procedure for Alkaline Metal Cleaners:
Add builders last with vigorous mixing until homogeneous.

Recommended Dilution for Alkaline Metal Cleaners:
1-2 oz./gal.

(a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
(b) Triton H-66, Union Carbide Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Aluminum Cleaners
Acid Aluminum Brightener

	%w
Neodol 91-8	4.5
Phosphoric acid (85%)	4.5
Citric acid	5.5
Butyl Oxitol glycol ether (a)	5.5
Phosphonic acid (b)	2.0
Water	to 100%

Properties:
Viscosity, 73F, cps: 5
Phase coalescence temp., F: >176
pH: 1.7

Blending Procedure for Aluminum Brightener:
Dissolve acids in water. Add Butyl Oxitol glycol ether and Neodol ethoxylate(s). Stir until clear solution is obtained.

Alkaline Aluminum Cleaner with Phosphate (c)

	%w
Neodol 91-6	3.0
C12 LAS (60%) (d)	3.3
Sodium metasilicate, pentahydrate	7.0
Tetrapotassium pyrophosphate	2.0
Phosphate ester (e)	7.0
Water	to 100%

Properties:
Viscosity, 73F, cps: 8
Phase coalescence temp., F: >176
pH: 13.3

Blending Procedure for Aluminum Cleaner:
Add builders last with vigorous mixing until homogeneous.

(a) Shell Chemical Co.
(b) Dequest 2010, Monsanto Co., or equivalent product.
(c) Not intended for soak type operation.
(d) Witconate 1260, Witco Chemical Co., or equivalent product.
(e) Triton H-66, Union Carbide Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Aluminum Cleaner
(Powder)

Soil: Light drawing oil
Surface: Aluminum
Application Method: Spray washer
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Metso Beads 2048	45.0
STPP	30.0
Sodium Bicarbonate	20.0
Sodium Resinate	3.0
*Octylphenoxy Polyethoxyethanol, 9-10 Moles EO	2.0

Use Dilution: 1.5-3.0% bw (2-4 oz/gal)

* Rohm & Haas, GAF

Metal De-Oiling Liquid Concentrate
(Liquid)

Soil: Petroleum-based oil
Surface: Metal: Steel, copper, aluminum, etc.
Application Method: Spray and/or immersion
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	42.0
Starso	12.0
EDTA, Tetrasodium (37%)	16.0
Sodium Xylene Sulfonate (40%)	20.0
*C9-C11 Linear Alcohol, 6 Moles EO	3.0
*C9-C11 Linear Alcohol, 2.5 Moles EO	7.0

Use Dilution: 2%-4% bv

* Shell, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Degreasing Solvent Cleaners

The following typical formulations are clear, microemulsions of d-Limonene and water. They represent the range of d-Limonene and water concentrations commonly used as degreasing solvent cleaners. These formulas are generally used by diluting in water (1-16 oz./gallon depending on use requirements). The formulas themselves are clear and exhibit a bloom effect upon dilution. In the formulations below the d-limonene can be replaced with a variety of solvents for use in different applications.

d-Limonene	10.0
Monamulse dL-1273	18.0
Isopropanol	10.0
Water	62.0

d-Limonene	35.0
Monamulse dL-1273	28.0
Isopropanol	5.0
Water	32.0

d-Limonene	65.0
Monamulse dL-1273	23.0
Isopropanol	0.0
Water	12.0

Procedure:

In all cases...mix Monamulse dL-1273 with d-Limonene or other solvents until dissolved. Add other ingredients except water. Mix until homogeneous. Add water slowly with stirring.

SOURCE: Mona Industries, Inc.: MONAMULSE dL-1273: Formulas

Gel Degreaser

The following is a brush-on type gel degreaser with good spray-rinse properties:

Water	30.0
N Silicate	5.0
Monamulse 653-C	25.0
Heavy Aromatic Naphtha	40.0

This degreaser is sufficiently viscous so that it will cling to a brush for use on vertical surfaces. Because of the water content in the above formula, it is comparatively less expensive and less hazardous than many other gel degreasers currently on the market. Monamulse 653-C permits the emulsified oily soil to be easily removed by spray rinsing, which normally follows a brush-on application. Also, application brushes can be rinsed clean under running water.

SOURCE: Mona Industries: MONAMULSE 653-C: Formulas

High Quality Metal De-Oiling Liquid Concentrates (Oil Spill/Rig Cleaners) For Heavy Oil

	%w
Neodol 91-6	3.0
Neodol 91-2.5	7.0
Sodium metasilicate, pentahydrate	7.0
EDTA (a)	6.0
Sodium cumene sulfonate (45%)	15.0
Water, dye	to 100%

Properties:
- Viscosity, 73F, cps: 77
- Phase coalescence temp., F: >165
- pH: 13.5

General Purpose

	%w
Neodol 91-6	5.0
Neodol 91-2.5	5.0
Sodium metasilicate, pentahydrate	7.0
EDTA (a)	6.0
Cyclo Sol 53 (b)	2.0
Sodium xylene sulfonate (40%)	17.5
Water, dye	to 100%

Properties:
- Viscosity, 73F, cps: 15
- Phase coalescence temp., F: 128
- pH: 12.7

Blending Procedure:

Part A: water, silicate, EDTA

Part B: sodium alkylaryl sulfonate, Neodol ethoxylate(s), Cyclo Sol 53.

Mix each part separately. Add Part A to Part B with mixing, until homogeneous.

Recommended Dilutions:
- Heavy-duty use: 4 oz./gal.
- Regular-duty use: 2 oz./gal.
- Light-duty use: 1 oz./gal.

(a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).

(b) Aromatic hydrocarbon, b.p. 325-349F, Shell Chemical Co.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

High Quality Metal De-Oiling Liquid Concentrates (Oil Spill/Rig Cleaners) For Light Oil

	%w
Neodol 91-6	7.0
Neodol 91-2.5	3.0
Sodium metasilicate, pentahydrate	7.0
EDTA (a)	6.0
Sodium xylene sulfonate (40%)	17.5
Water, dye	to 100%

Properties:
Viscosity, 73F, cps: 9.0
Phase coalescence temp., F: >176
pH: 12.7

Spray Cleaner with Phosphate

	%w
Neodol 1-5	2.0
Tetrapotassium pyrophosphate	13.0
Potassium hydroxide (45%)	12.0
Sodium silicate (37.5%) (c)	12.0
Sodium cumene sulfonate (45%)	8.0
Water, dye	to 100%

Properties:
Viscosity, 73F, cps: 3
Phase coalescence temp., F: >165
pH: 13.7

Blending Procedure:
Part A: water, silicate, EDTA.
Part B: sodium alkylaryl sulfonate, Neodol ethoxylate(s), Cyclo Sol 53.
Mix each part separately. Add Part A to Part B with mixing, until homogeneous.

Recommended Dilutions:
Heavy-duty use: 4 oz./gal.
Regular-duty use: 2 oz./gal.
Light-duty use: 1 oz./gal.

(a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
(c) Mole ratio $Na_2O:SiO_2=1:1.8$, such as Starso Silicate, PQ Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Household Metal Polish, Soft Paste Wax

Ingredients:	Percent by Weight
1) Hoechst Wax LP	2
2) Hoechst Wax E	3
3) Oleic acid	4
4) Odorless kerosene	20
5) Trichlorethylene	2
6) Ammonium citrate	4
7) Ammonium hydroxide, 26-deg.	15
8) Deionized water	25
9) Kaopolite SF or 1168	25

Procedure:

Melt (1) and (2) at 180-190 F., add (3), (4) and (5), reheating to 140F. In another vessel, dissolve (6) and (7) in (8), heat to 140F., then add to the previous mixture with stirring. With good agitation, slowly add (9), shut off heat and continue agitation until cooled to below 100F.

SOURCE: Kaopolite, Inc.: Suggested Formulation

Aluminum Cleaner

Composition:	%
Kelzan xanthan gum	1.0
Butyl Cellosolve	4.0
Tergitol NP	3.0
Phosphoric Acid (85 percent)	3.0
Citric Acid	4.0
Sodium Dichromate	
Water	

Procedure:

Dissolve Kelzan xanthan gum in water. Add the citric and phosphoric acids followed by butyl cellosolve and Tergitol NP. To use, spread evenly on the surface to be cleaned and allow sufficient time for the cleaning action to be accomplished.

SOURCE: Kelco Division: KELZAN Xanthan Gum: Formula

Liquid Rust Removers

Mirataine ASC	2.0
Potassium Hydroxide (45%)	75.0
Triethanolamine	12.0
Water	11.0
Mirataine ASC	4.0
Sodium Hydroxide (50%)	50.0
Sodium Gluconate	6.0
Cheelox BF-13	1.0
Water	39.0

SOURCE: Rhone-Poulenc: Formulas

Liquid Degreasing Steam Cleaner

	Wt. %
Water	81.5
Sodium Metasilicate Pentahydrate	2.0
50% NaOH	9.5
Trisodium NTA	1.0
Tomah AO-14-2	1.5
Tomah Q-14-2	1.5
Nonionic Surfactant	3.0

pH: 12.6
SpG: 1.0308 @ 74F.
Wt./Gal.: 8.59 @ 74F.

Powdered Steam Cleaner

	Wt. %
Soda Ash	80.0
Sodium Tripolyphosphate	10.0
Triton X-100	8.0
Tomah Alkali Surfactant	2.0

SpG: 0.9656 @ 74F.
Wt./Gal.: 8.0 @ 74F.

Powdered Steam Cleaner

	Wt. %
Soda Ash	65.0
Triton X-100	2.0
Tomah Alkali Surfactant	2.0
Sodium Metasilicate Pentahydrate	15.0
Trisodium NTA	2.0
Sodium Gluconate	4.0
Flake Caustic Soda (NaOH)	10.0

SpG: 0.9656 @ 74F.
Wt./Gal.: 8.0 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Liquid Heavy Duty Alkaline Cleaner

This is a good starting formulation for general all-purpose cleaning, especially where heavier soil loads are encountered.

Water	40.0%
N Sodium Silicate	40.0
Sodium Hydroxide (50%)	10.0
Monaterge 85	10.0

Surface Tension (dynes/cm - 2% solution @ 20C): 30.3
Use Dilutions: Medium Duty: 2 to 4 oz./gal.
Heavy Duty: 4 to 8 oz./gal.
pH (as is): 12.7
Foam: Moderate

Mixing Procedure:
Charge water, start agitation and then add N Sodium Silicate. Add NaOH solution and agitate until clear. Finally, add Monaterge 85 and continue agitation (approx. 45 minutes) until solution clears.

Powdered Heavy Duty Alkaline Cleaner

Sodium Metasilicate Anhydrous	31.7%
Sodium Hydroxide Flakes	31.7
Sodium Carbonate	31.6
Monaterge 85	5.0

Mixing Procedure:
Blend powders well in suitable non-aluminum mixing vessel using traditional spray methods for incorporating Monaterge 85.

Liquid Heavy Duty Alkaline Cleaner

Water	54.7%
Tetrapotassium Pyrophosphate (60%)	25.3
Sodium Hydroxide (50%)	10.0
Monaterge 85	10.0

Mixing Procedure:
Add ingredients in the order listed with good agitation.
pH (as is): 13.7
Foam: Moderate

SOURCE: Mona Industries, Inc.: MONATERGE 85: Formulas

Liquid Heavy-Duty Alkaline-Solvent Cleaner/Degreaser

An excellent, stable solvent degreaser with a pH of approximately 12.5 can be prepared as follows:

	w/w
Aromatic 150	40.0%
Monamulse 947	20.0%
NaOH (50%)	4.0%
Water	36.0%

Mixing Procedure:

Add the ingredients in the order listed with good agitation. After the product has cleared, continue the agitation for at least 15 minutes to assure maximum product stability and uniformity.

Use Concentrations:

Truck and rail cars: 1/2-1 quart per gallon of water

Heavy duty cleaning: Approximately 2 quarts per gallon of water.

Rinse with either cold or hot water or steam.

This formulation has been stored at 40F and room temperature for several months and remains an essentially clear, opalescent liquid.

Spray Degreaser

The following waterless concentrate can be used for engine degreasing, silk screen cleaning, or other spray applications.

	W/W
Aromatic 150	80.0%
Monamulse 947	20.0%

Mixing Procedure:

Add the ingredients in the order listed with moderate agitation.

Use Concentration:

Aspirate at approximately one ounce per gallon.

SOURCE: Mona Industries, Inc.: MONAMULSE 947: Formulas

Liquid Steam Cleaner

	Wt. %
Water	65.0
Trisodium NTA	1.0
Sodium Gluconate	4.0
45% KOH	25.0
Tomah Alkali Surfactant	3.0
Nonionic Surfactant	2.0

pH: 13.5
SpG: 1.217 @ 74F.
Wt./Gal.: 9.34 @ 74F.

Liquid Steam Cleaner

	Wt. %
Water	79.0
Sodium Metasilicate Pentahydrate	1.0
Sodium Tripolyphosphate	10.0
Tomah Alkali Surfactant	5.0
Nonionic Surfactant	5.0

pH: 10.4
SpG: 1.1050 @ 74F.
Wt./Gal.: 9.20 @ 74F.

Liquid Steam Cleaner

	Wt. %
Water	73.0
Sodium Tripolyphosphate	5.0
50% NaOH	10.0
42 Sodium Silicate 3.22/1	8.0
Tomah Alkali Surfactant	2.0
Nonionic Surfactant	2.0

pH: 12.3
SpG: 1.0933 @ 74F.
Wt./Gal.: 9.11 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Low Foaming Acid Cleaner

In this low foaming acid cleaner 0.5% active of Phosphoteric T-C6 effectively hydrotropes the low foaming nonionic while other commonly used hydrotropes (such as Triton H-66, Dowfax 2A1, Triton BG-10; or SXS) will hydrotrope only when present at greater than 2.0% active. Additionally, Phosphoteric T-C6 contributes wetting and surface tension reduction which some of the above fail to provide at any concentration.

	Wt. %	Act. %
Water	80.6	----
Phosphoric Acid (85%)	15.0	12.75
Triton DF-12	3.0	3.00
Phosphoteric T-C6	1.4	0.50

Recommended use dilution: 1:20
Cloud point (1:20 dil. in 250 ppm H2O): 40C
Draves wetting (1:20 dil. in 250 ppm H2O): 7 sec.
Foam height (1:20 dil. in 250 ppm H2O, 160F): 5 ml.

SOURCE: Mona Industries, Inc.: PHOSPHOTERIC T-C6: Formula

Liquid Acid Cleaner

	Parts by Weight
Monateric CyNa-50	2.0%
Gluconic Acid	6.0%
Phosphoric Acid (85%)	54.7%
Water	37.3%

SOURCE: Mona Industries, Inc.: MONATERIC CyNa-50: Formula

Metal Cleaner

Component:	Wt. %
Alfonic 810-60 Ethoxylate	0.8
Trisodium Phosphate	0.8
Sodium Ash	0.8
Sodium Hydroxide	0.8
Water	q.s.

q.s.=quantity sufficient to make 100 percent

Properties:
Approximate pH: 13.0
Freeze Pt. (F): 17.4
Viscosity (cps) (25C): 1.08

Order of Addition:
Surfactant, Trisodium Phosphate, Tetrasodium Pyrophosphate, Soda Ash, Sodium Hydroxide, Water

SOURCE: Vista Chemical Co.: Example Starting Formulation

Low Foaming Alkaline Cleaner

In the following low foaming alkaline cleaner, using Surfonic LF-17 as the nonionic, a clear solution is obtained with 3.0% active Phosphoteric T-C6. In order to obtain a clear solution using Dowfax 2A1, 5.7% active is required and Triton BG-10 will not clerify the system at any concentration.

	Wt. %	Act. %
Water	69.5	----
NaOH (50%)	20.0	10.0
Surfonic LF-17	1.5	1.5
Phosphoteric T-C6	9.0	3.2

Cloud point: 32C
Recommended use dilution: 1:20
Foam height (1:20 dil. in 250 ppm H2O, RT): 3 ml.

High Foaming Alkaline Cleaner

In this high foaming alkaline cleaner using DDBSA (Dodecylbenzene sulfonic acid), Phosphoteric T-C6 clarifies the system at 2.0% active. Triton BG-10, Dowfax 2A1 or SXS will clarify the system only when used at concentrations of greater than 4.0% active.

	Wt. %	Act. %
Water	72.8	----
NaOH (50%)	20.0	10.0
DDBSA	1.5	1.5
Phosphoteric T-C6	5.7	2.0

Recommended use dilution: 1:20
Draves wetting (1:20 dil. in 250 ppm H2O): 20 sec.
Foam height (1:20 dil. in 250 ppm H2O, RT): 85 ml.

SOURCE: Mona Industries, Inc.: PHOSPHOTERIC T-C6: Formulas

Liquid Heavy Duty Alkaline Cleaner

	% by Weight
Water	51.4
Sodium Hydroxide (50%)	10.0
Tetrapotassium Pyrophosphate	23.6
Monatrope 1296 (as supplied)	10.0
Igepal CO-710	5.0

Procedure:
Add in order listed making sure each ingredient is dissolved before next addition.
Cloud Point: 50C
Recommended Use Dilution: 2 oz./gallon
SOURCE: Mona Industries, Inc.: MONATROPE 1296: Formulas

Low Temperature Iron Phosphating

Ingredient:	Weight %
Monosodium Phosphate (MSP)	80-90
Sodium Acid Pyrophosphate (SAPP)	6- 9
Sodium Molybdate	1- 2
Triton N-101	5- 6

Use Level: 2 oz/gal
Suggested Temperature: 110-125F

Iron Phosphating

Ingredient:	Weight %
Monosodium Phosphate (MSP)	38-42
Dequest 2000	2- 3
Sodium Molybdate	1- 2
Water	53-59

Use Level: 2-3% by volume
Suggested Temperature: 150-160F

Cleaning/Phosphating Solution

Ingredient:	Weight %
Monosodium Phosphate (MSP)	30-32
Phosphoric Acid, 75%	1- 2
Sodium Molybdate	0.1-0.2
Triton N-101	1- 3
Sodium Xylene Sulfonate	15-18

Use Level: 2-3% by volume
Suggested Temperature: 140-160F

Zinc Phosphating-Spray

Ingredient:	Weight %
Phosphoric Acid, 75%	62.5
Zinc Oxide	11.6
Water	16.2
Sodium Sulfate	0.6
Nickel Nitrate	9.1
Accelerated with Sodium Nitrate	

Use Level: 2-3% by volume
Suggested Temperature: 165F

SOURCE: Monsanto Co.: Metal Treating: Formulas

Metal Cleaners
Paint Stripper (Base)

	%w
Neodol 25-3S (60%)	2.0
Sodium hydroxide (50%)	30.0
Sodium xylene sulfonate (40%)	3.0
Water, accelerator	to 100%

Properties:
Viscosity, 73F, cps: 8
Phase coalescence temp., F: >185
pH: 13.3

Alkaline Wash Powder(a)
With Phosphate

	%w
Neodol 91-6 (b)	5.6
Neodol 91-2.5 (b)	2.4
Sodium metasilicate, anhydrous	35.0
Sodium tripolyphosphate	20.0
Sodium carbonate	22.0
Sodium hydroxide, beads	15.0

Non-Phosphate Powder

	%w
Neodol 91-6 (b)	5.6
Neodol 91-2.5 (b)	2.4
Sodium metasilicate, anhydrous basis	35.0
Sodium carbonate	37.0
Sodium hydroxide, beads	20.0

Blending Procedure for Alkaline Wash Powders:
Mix solid builders thoroughly. Add surfactants slowly while mixing, mix thoroughly.

(a) May use as soak tank cleaner.
(b) May substitute both Neodol 91-6 and 91-2.5 with Neodol 1-5.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Metal Cleaner
(Powder)

Soil: Drawing lubricant, animal fat and grease
Surface: Steel
Application Method: Spray
Manufacture: Ribbon or paddle blender

Composition:	% Wt
STPP	10.0
Sodium Carbonate	25.0
*Poly-Tergent S-305LF	5.0
Metso Beads 2048	30.0
Sodium Hydroxide Beads	30.0

Use: Heavy duty low-foaming metal cleaner which is good for a spray cleaning process.
Use Dilution: 0.8-1.5% bw (1-2 oz/gallon)

* Olin (alkoxylated linear alcohol nonionic surfactant, low foam)

Metal Cleaner
(Powder)

Soil: Oil, drawing lubricant, animal fat and grease
Surface: Steel
Application Method: Immersion
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Sodium Carbonate	20.0
STPP	8.0
*Octylphenoxy Polyethoxyethanol, 9-10 moles EO	2.0
Metso Beads 2048	30.0
Sodium Hydroxide Beads	40.0

Use Dilution: 2.3-4.5% bw (3-6 oz/gallon)

* Rohm & Haas, GAF

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Metal Cleaner (Powder)

Soil: Oil, drawing lubricant, animal fat and grease
Surface: Steel
Application Method: Immersion/electrolytic cleaning
Manufacturer: Ribbon or paddle blender

Composition:	% Wt
TSPP	5.0-20.0
TSP	5.0-10.0
Metso Beads 2048	20.0-40.0
Sodium Carbonate	8.0-20.0
*Octylphenoxy Polyethoxyethanol, 12-13 Moles EO	0.0- 2.0
Sodium Hydroxide Beads	20.0-40.0

Use Dilution: 2.3-4.5% bw (3-6 oz/gallon)

* Rohm & Haas, GAF

Metal Cleaner (Liquid)

Soil: Petroleum and animal oil and grease
Surface: Metal: Steel
Application Method: Immersion
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	65.6
Star	15.6
Sodium Hydroxide (50%)	6.3
*Phosphate Ester	5.0
**C9-C11 Linear Alcohol, 6 Moles EO	7.5

Use Dilution: 2%-5% b.v.

* Mona Industries, Rohm & Haas
** Shell, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Metal Conditioner, Wash-off Type

	% by Vol.
Nonionic surfactant*	2.0
Phosphoric Acid, 85%**	47.2
Butyl Cellosolve	16.0
Water	34.8

This cleaner can be applied by spray, dip or flow-brush. It should be left on clean metal long enough to wet it completely, and on rusted metal long enough to loosen the rust. It is then flushed off with water, preferably hot water.

Metal Conditioner, Wipe-off Type

	% by Vol.
Nonionic surfactant*	2.0
Phosphoric Acid, 85%**	14.0
Butyl Cellosolve	25.0
Water	59.0

This cleaner should be left on the metal surface for about 30 seconds. It should then be wiped off with damp and then dry rags. The surface may show a film of gray-white iron phosphate and is then ready for coating.

* Plurafac RA-43 or Pluronic 25R2, BASF or Triton CF12 or DF12, Union Carbide.
** Monsanto Co.

SOURCE: Monsanto Co.: Acid Cleaners: Formulas

Metal Cleaner, Solvent Emulsion

Ingredients:	Wt Percent
Triton Nonionic Surfactant N-57	12.0
Cresylic Acid	5.0
Kerosene	83.0

Mixing Instructions:
Add Triton N-57 to the kerosene and then slowly add the cresylic acid.
Directions for Use:
Submerge metal parts in this solution and allow to remain for a while. Parts should be agitated or scrubbed before removal. Upon removal, rinse with water and dry.

SOURCE: Union Carbide Chemicals and Plastics Co., Inc.: Formula

Metal Treating Bath

Calsoft LAS-99 is a strong organic acid surface active agent, equally compatible with mineral acids and with organic metal cleaning and pickling acids. At concentrations below 0.5% of total solution weight, it promotes rapid grease and oil film removal, superior surface wetting, and complete film-free and residue-free rinsability of metal surfaces.

Acid Aluminum Cleaner

Calsoft LAS-99	3.00%
Butyl Cellosolve	4.00
Phosphoric Acid (85%)	3.00
Citric Acid	4.00
Water	85.95
Sodium Chromate	0.05

Pilot Formula #176

Metal Treating Bath

Calsoft L-40 promotes rapid grease and oil film removal, superior surface wetting, and complete film-free and residue-free rinsability for metals.

Calsoft L-40	15%
Phosphoric Acid (85%)	10
Wjite Oleic Acid	2
Ethoxylated Octyl Phenol	6
Water	67

Use: 2 oz. per gallon
Pilot Formula #215

Metal Treating Bath

Calamide C	8.0%
Calsoft L-40	3.0
Trisodium Phosphate	2.0
Isopropyl Alcohol	3.0
Water	87.9
Perfume	0.1
Preservative	Q.S.

SOURCE: Pilot Chemical Co.: Pilot Formula #215

Rust Removers-Liquid

Acid

	%w
Neodol 91-6	2.5
Phosphoric acid (85%)	14.0
Butyl Dioxitol glycol ether (a)	4.0
Water	to 100%

Properties:
- Viscosity, 73F, cps: 5
- Phase coalescence temp., F: >150
- pH: 1.0

Alkaline

	%w
Neodol 91-6	4.0
Sodium heptagluconate (b)	1.0
Potassium hydroxide (45%)	35.0
Monoethanolamine	5.0
Phosphate ester (c)	8.5
Water	to 100%

Properties:
- Viscosity, 73F, cps: 10
- Phase coalescence temp., F: >165
- pH: 14

Use Instructions:
The cleaners may be diluted or used "as is." Use acid formula on non-ferrous metals (e.g., aluminum, zinc) at temperatures below 165F in stainless steel tanks. Use alkaline formula on ferrous metals at temperatures above 135F.

(a) Shell Chemical Co.
(b) May replace with ethylenediamine tetraacetic acid (EDTA).
(c) Triton H-66, Union Carbide Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Solvent Cleaner

	% by Weight
Water	79.5
TKPP (Powder)	5.0
Sodium Metasilicate (Anhydrous)	5.0
Monateric 1188M	4.5
Igepal CO-710 (NPE 10-11)	1.0
Ethylene Glycol Monobutyl Ether	5.0

Procedure:
Blend Water, TKPP, and SMS together until dissolved, add remaining ingredients.

Typical Properties:
Appearance: Clear Liquid
Cloud Point: 54C
Kraft Point: <0C

Medium Duty Alkaline Cleaner

	% by Weight
Water	86.5
TKPP (Powder)	5.0
Sodium Metasilicate (Anhydrous)	5.0
Monateric 1188M	1.5
Igepal CO-710 (NPE 10-11)	2.0

Procedure:
Blend Water, TKPP, and SMS together until dissolved, add remaining ingredients.

Typical Properties:
Appearance: Clear Liquid
Cloud Point: 83C
Kraft Point: >0C
Recommended use dilution 1:10 with water

SOURCE: Mona Industries, Inc.: MONATERIC 1188M: Formulas

Industrial Cleaners

Viscous Liquid Alkaline Cleaner

	Parts by Weight
Monateric CA-35	10.0%
Sodium Metasilicate (5 H2O)	20.0%
Sodium Hydroxide	3.3%
Water	66.7%

Liquid Acid Cleaner

	Parts by Weight
Monateric CA-35	2.0%
Gluconic Acid (50%)	6.0%
DPhosphoric Acid (85%)	54.7%
Water	37.3%

SOURCE: Mona Industries, Inc.: MONATERIC CA-35: Formulas

Spray Metal Cleaning

Triton CF-54 is ideally suited for compounding with highly alkaline metal-cleaning detergents. It does not discolor or lose any of its surface-active properties, even when in contact with flake caustic for prolonged periods at room or elevated temperatures in open or closed containers. It is completely stable in the cleaning bath; its low-foam cheracteristic prevents foam build-up and overflow of the tank; it dedusts the caustic mix; and it significantly improves the removal of soils commonly encountered in metal cleaning.

The alkaline base consisted of:

Ingredients:	Wt Percent
Sodium Hydroxide	32
Sodium Metasilicate, anhydrous	32
Sodium Carbonate (Soda Ash)	36

Addition of 2.5-percent Triton CF-54 to this base resulted in more rapid and more complete soil removal with no observable foam development.

SOURCE: Union Carbide: TRITON Nonionic Surfactant CF-54: Formula

Metal Cleaning-Spray Washing

Triton CF-10 is used in heavy-duty, metal-cleaning formulations to remove various soils. It is particularly suited to spray washing operations where foam must be controlled. No appreciable foam is produced at temperatures above 100F, even under high spray pressures. A typical formulation is:

Ingredients:	Wt Percent
Triton CF-10	5
Sodium Hydroxide (Caustic Soda)	30
Sodium Carbonate (Soda Ash)	30
Sodium Metasilicate Pentahydrate	35

SOURCE: Union Carbide: TRITON Nonionic Surfactant CF-10: Formula

Metal Cleaner, Solvent-Emulsifier

Ingredients:	Wt Percent
Triton X-45	12.0
Cresylic Acid	5.0
Kerosene	83.0

Mixing Instructions:

Add Triton X-45 to the kerosene, then slowly add cresylic acid

Directions for Use:

Submerge metal parts in the solution. Agitate or scrub parts. After removing them, rinse with water and dry.

SOURCE: Union Carbide: TRITON Nonionic Surfactant X-45: Formula

Spray Metal Cleaning Concentrate-A

	% By Weight
Sodium Metasilicate	3
Sodium Carbonate	4
Sodium Hydroxide	5
Monatrope 1250 (as supplied)	5.5
Surfonic LF-17	1

Cloud Point: 78C
Recommended Use Dilution: 1:40
Foam Height @ 60C: None

Spray Metal Cleaning Concentrate-B

	% by Weight
Sodium Metasilicate	3
Sodium Carbonate	4
Sodium Hydroxide	5
Monatrope 1250 (as supplied)	11
Surfonic LF-17	2

Cloud Point: 96C
Recommended Use Dilution: 1:40
Foam Height @ 60C: None

SOURCE: Mona Industries, Inc.: MONATROPE 1250: Formulas

Alkaline Metal Cleaner

	% by Weight
Water	63.5
Sodium Hydroxide (50%)	3.0
Sodium Metasilicate Pentahydrate	7.0
Trisodium Phosphate	2.0
Tetrasodium EDTA	7.5
Monatrope 1296 (as supplied)	7.0
Igepal CO-710	10.0

Procedure:
Add in order listed making sure each ingredient is dissolved before next addition.
Cloud Point: 51C
Recommended Use Dilution: 2 oz./gallon

SOURCE: Mona Industries, Inc.: MONATROPE 1296: Formula

Steam Cleaners

Steam/Spray Liquid

	%w
Neodol 91-6	0.4
Sodium silicate (37.5%) (a)	15.2
Tetrapotassium pyrophosphate	17.2
Potassium hydroxide (45%)	31.1
Phosphate ester (b)	2.0
Water	to 100%

Properties:
Viscosity, 73F, cps: 11
Phase coalescence temp., F: >176
pH: 14

Blending Procedure:
Add builders last with vigorous mixing until homogeneous.

Powder

	%w
Neodol 91-6	2.5
LAS (97%) (c)	2.5
Sodium metasilicate, anhydrous	15.0
NTA (d)	3.0
Sodium gluconate	4.0
Sodium hydroxide, beads	10.0
Sodium carbonate	63.0

Blending Procedure:
Mix LAS and sodium carbonate thoroughly. Add other builders. Add Neodol 91-6 slowly while mixing, mix thoroughly.

Recommended Dilution:
6 oz./gal.

Non-Phosphate Concentrate

	%w
Neodol 91-8	3.0
C12 LAS (60%) (e)	1.6
Potassium hydroxide (45%)	25.0
NTA (d)	1.0
Sodium gluconate	4.0
Sodium xylene sulfonate (40%)	12.0
Water	to 100%

Properties:
Viscosity, 73F, cps: 7
Phase coalescence temp., F: >165
pH: 14

Blending Procedure:
Add builders last with vigorous mixing until homogeneous.

Recommended Dilution:
1 part cleaner to 50 parts water (2.6 oz./gal.).

(a) Mole ratio Na2OSiO2=1:1.8 such as Starso Silicate, PQ Corp., or equivalent product.
(b) Triton H-66, Union Carbide Corp., or equivalent product.
(c) Linear alkylbenzene sulfonic acid. Such as Bio-Soft S-100, Stepan Co., or equivalent product.
(d) Nitrilotriacetic acid trisodium salt. May replace with ethylenediamine tetraacetic acid (EDTA).
(e) Witconate 1260, Witco Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Tank Cleaners
Soak Tank

	%w
Neodol 91-8	4.5
Neodol 91-2.5	0.5
Potassium silicate (29.1%) (a)	15.0
Potassium hydroxide (45%)	10.0
EDTA (b)	1.9
Sodium xylene sulfonate (40%)	7.0
Water	to 100%

Properties:
- Viscosity, 73F, cps: 6
- Phase coalescence temp., F: >165
- pH: 13.5

Fuel Oil (Bunker C) Tank

	%w
Neodol 91-6 (c)	4.3
Neodol 25-3	1.4
Neodol 45-7 (c)	2.9
Tetrapotassium pyrophosphate	1.4
Sodium metasilicate, pentahydrate	2.0
Sodium xylene sulfonate (40%)	6.0
Water	to 100%

Properties:
- Viscosity, 73F, cps: 7
- Phase coalescence temp., F: 131
- pH: >12

(a) Mole ratio $K_2O:SiO_2=1:3.9$ such as Kasil #1, PQ Corp., or equivalent product.
(b) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
(c) Neodol 91-8 can be used in place of Neodol 91-6, and Neodol 25-7 or Neodol 23-6.5 can be used in place of Neodol 45-7, with only very minor changes in physical properties.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

10. Polishes, Coatings and Sealers

Aerosol Furniture Polish

Formulation E2-7300 uses a unique blend of silicone fluids which gives this polish excellent gloss with a minimal smear.

The concentrate may be used as a liquid furniture polish or to formulate an aerosol product.

Aerosol Concentrate:

Part:	Ingredients:	Percent by Weight
A	200 Silicone Fluid by Dow Corning, 10,000 cs.	1.0
	200 Silicone Fluid by Dow Corning, 350 cs.	4.0
	Witcamide 511	1.4
	L-140 Solvent	14.0
	Lemon Fragrance	0.5
B	C-340 Carnauba Wax Emulsion	16.0
	Water	63.1

Preparation:

1. Add all ingredients in Part A into vessel with good agitation.
2. When Part A is mixed thoroughly, add Part B with good agitation.

Suggested Aerosol Formulation:

Ingredients:	Percent by Weight
E2-7300 Concentrate	80.0
Aerosol Propellant	20.0

Formulation E2-7300

Liquid Appliance & Kitchen Counter Top Polish

Formulation E2-7236 is designed for use on such surfaces as appliances, kitchen counter tops, stainless steel, chrome, and plastics. This formulation provides a substrate with a glossy surface and offers some protection from detergent washings.

Ingredients:	Percent by Weight
Dow Corning 929 Cationic Emulsion	1.38
Dow Corning 347 Emulsion	2.54
Water	94.58
Makon 4 (or Makon 6)	0.50
50% Solution of Sodium Citrate in Water	1.00
Acetic Acid	0.50

Preparation:

1. Load Dow Corning 929 Cationic Emulsion and Dow Corning 347 Emulsion into mixing vessel.
2. Start low-shear mixer.
3. Add water.
4. When mixture is uniform, premix Makon 4 (or Makon 6) and the sodium citrate solution. Slowly add premix to mixing vessel.
5. Mix until uniform. Package.

SOURCE: Dow Corning Corp.: Formulation E2-7236

Aerosol Shoe Polish

Formulation E2-7253 produces a product that is used to polish shoe surfaces such as vinyl and leather. When applied, this polish will impart excellent gloss and water repellency to the shoe surface.

Aerosol Concentrate:

Part:	Ingredients	Percent by Weight
A	200 Silicone Fluid by Dow Corning, 60,000 cs.	1.0
	Carnauba Wax	2.4
	Hoechst V Wax	0.5
	Beeswax	0.5
	Paraffin	2.2
	Toluene	63.8
B	Isopropanol	19.6
	Turpentine	10.0

Suggested Aerosol Formulation:

Ingredients:	Percent by Weight
Concentrate E2-7253	80
Propellant of choice	20

Preparation:

1. Heat Part A until clear in color.
2. Add Part B to Part A and pressure fill using propellants of choice.

Formulation E2-7253

Shoe Polish Paste Wax

Formulation E2-7254 imparts a high gloss and excellent water repellency to leather and vinyl surfaces. It is easy to apply and buff out.

Ingredients:	Percent by Weight
200 Silicone Fluid by Dow Corning, 350 cs.	4.0
Carnauba Wax #1 Yellow	8.0
Petronauba D Wax	2.0
Stoddard Solvent	86.0

Preparation:

1. Melt the mixture.
2. Cool and pour at 115F to 120F (46C to 49C).

SOURCE: Dow Corning Corp.: Formulation E2-7254

Antistatic Floor Polish
ML-870-408 20% Solids

Use in environments where control of static discharge is desired. For best results this polish should be used as part of program to control electro-static discharge (ESD). Maintain by damp mopping and with restorers designed for static control. The polish may be spray buffed. Up to three coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	46.23	393.50	47.23
2) Diethylene Glycol Monoethyl Ether	4.45	37.88	4.59
3) Tributoxyethyl Phosphate	1.12	9.53	1.12
4) Dibutyl Phthalate	0.58	4.94	0.57
5) Igepal CO 977	0.18	1.53	0.17
6) Fluorad FC-129 (1% solution)	0.59	5.02	0.60
7) Antifoam*	0.02	0.17	0.02
8) Proxel GXL	0.10	0.85	0.09
9) ML-870 Latex (38%)	31.26	266.08	30.27
10)Morton Conrez 510 (25% solution)	6.67	56.77	6.50
11)AC-325 Nonionic (35%)	3.59	30.56	3.65
12)E-43 Nonionic (40%)	3.14	26.73	3.18
13)Larostat 477	2.07	17.62	2.01

Procedure:

With good agitation add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 74/10/16
Typical pH: 8.5
Formulation Density: 8.51 lbs./gal.
Specific Gravity: 1.022

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.56
Specific gravity: 1.027
Solids: 20%:
Pounds/gal: 8.51
Specific gravity: 1.022
Solids: 15%:
Pounds/gal: 8.47
Specific gravity: 1.016

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-870-408

Concrete Sealer
Mor-Flo 155-362 18% Solids

Use as a sealer coat on interior concrete surfaces. Two or more coats per application are suggested and may be applied with 30-45 min. drying time depending on solids and conditions. To alter performance, Mor-Flo 155 based sealers may be modified with the addition of nonionic wax emulsions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	50.32	425.44	51.06
2) Tributoxyethyl Phosphate	0.37	3.13	0.37
3) Dibutyl Phthalate	1.32	11.16	1.28
4) Ethylene Glycol	1.65	13.95	1.50
5) Diethylene Glycol Monobutyl Ether	2.64	22.32	2.81
6) Fluorad FC-129 (1% solution)	0.73	6.17	0.74
7) Antifoam*	0.05	0.42	0.05
8) Proxel GXL	0.10	0.85	0.09
9) Mor-Flo 155 Latex (38%)	42.82	362.03	42.10

Procedure:

With good agitation add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 8.0
Formulation Density: 8.45 lbs./gal.
Specific Gravity: 1.015

Typical Density Values:

Solids: 25%:
- Pounds/gal: 8.50
- Specific gravity: 1.021

Solids: 20%:
- Pounds/gal: 8.47
- Specific gravity: 1.017

Solids: 15%:
- Pounds/gal: 8.43
- Specific gravity: 1.012

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Sealer Formulation

Creamy Furniture Polish

Formulation CP7-0193B produces a polish with a cream-type consistency which imparts excellent gloss to furniture surfaces.

Ingredients:	Percent by Weight
Dow Corning 346 Emulsion	3.20
Dow Corning 1101 Emulsion	1.00
*10% Carnauba Wax Emulsion	2.20
Water	83.40
2% Carbopol 934 in Water	10.00
Morpholine	0.20

*Carnauba Wax Emulsion:	Percent by Weight
Carnauba Wax #1 Yellow	10.00
Tween 80	3.00
Water	87.00

***Preparation of Carnauba Wax Emulsion:**
1. Add Tween 80 to wax and heat to 200F (93C).
2. Heat water to 200F (93C).
3. With mechanical agitation, add wax mixture to water.
4. Cool to room temperature with continuous stirring.

* Co-Wax (a self-emulsifying wax product of Concord Chemical Co.) may be used instead of the emulsion.

Formulation of CP7-0193B Preparation:
1. Mix Dow Corning 346 and 1101 Emulsion and Carnauba Wax Emulsion.
2. Add water while mixing.
3. While stirring with a propeller-type mixer, add the Carbopol 934 and Morpholine in that order.
4. Package when blending is complete.

Use Instructions:
Apply sparingly, then wipe to a shine with a cloth pad.

SOURCE: Dow Corning Corp.: Formulation CP7-0193B

Floor Polish
ML-850-407 20% Solids

Use with low speed spray buffing maintenance programs. Maintains a high initial gloss and can be recoated rapidly. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to seven coats per application may be applied with 25-40 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	42.05	359.90	43.21
2) Diethylene Glycol Monoethyl Ether	4.55	38.94	4.72
3) Tributoxyethyl Phosphate	1.18	10.10	1.19
4) Dibutyl Phthalate	0.54	4.62	0.53
5) Fluorad FC-129 (1% solution)	0.62	5.31	0.63
6) Antifoam (2)	0.02	0.17	0.02
7) Proxel GXL	0.10	0.86	0.09
8) ML-850 Latex (38%)	34.51	295.37	33.19
9) Morton Conrez 510 (25% solution)	8.20	70.18	8.03
10)AC-325 Nonionic (35%)	4.39	37.57	4.48
11)E-43 Nonionic (40%)	3.84	32.87	3.91

Procedure:

With good agitation add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 72/11/17
Typical pH: 9.0
Formulation Density: 8.56 lbs./gal.
Specific Gravity: 1.027

Typical Density Values:

Solids: 25%:
- Pounds/gal: 8.62
- Specific gravity: 1.035

Solids: 20%:
- Pounds/gal: 8.56
- Specific gravity: 1.027

Solids: 15%:
- Pounds/gal: 8.50
- Specific gravity: 1.020

(2) SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-850-407

Floor Polish
ML-860-17 20% Solids

Use with low speed spray buffing maintenance programs. Maintains a high initial gloss with very good long term durability. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	42.36	361.06	43.36
2) Diethylene Glycol Monoethyl Ether	4.97	42.36	5.13
3) Tributoxyethyl Phosphate	1.24	10.57	1.24
4) Dibutyl Phthalate	0.65	5.54	0.63
5) Igepal CO 977	0.20	1.70	0.18
6) Fluorad FC-129 (1% solution)	0.60	5.11	0.61
7) Antifoam*	0.02	0.17	0.02
8) Proxel GXL	0.10	0.85	0.09
9) ML-860 Latex (38%)	34.89	297.39	33.83
10)Morton Conrez 510 (25% solution)	7.45	63.50	7.27
11)AC-325 Nonionic (35%)	4.01	34.18	4.08
12)E-43 Nonionic (40%)	3.51	29.92	3.56

Procedure:

With good agitation add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 74/10/16
Typical pH: 8.0
Formulation Density: 8.52 lbs./gal.
Specific Gravity: 1.023

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.57
Specific gravity: 1.029
Solids: 20%:
Pounds/gal: 8.52
Specific gravity: 1.023
Solids: 15%:
Pounds/gal: 8.47
Specific gravity: 1.017

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-860-17

Floor Polish
ML-870-389 20% Solids

Use with low speed spray buffing and high speed maintenance programs. This product maintains a high initial gloss and can be burnished on an intermittent schedule. With these maintenance procedures, a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	42.36	361.06	43.36
2) Diethylene Glycol Monoethyl Ether	4.97	42.36	5.13
3) Tributoxyethyl Phosphate	1.24	10.57	1.24
4) Dibutyl Phthalate	0.65	5.54	0.63
5) Igepal CO-977	0.20	1.70	0.18
6) Fluorad FC-129 (1% solution)	0.60	5.11	0.61
7) Antifoam*	0.02	0.17	0.02
8) Proxel GXL	0.10	0.85	0.09
9) ML-870 Latex (38%)	34.89	297.39	33.83
10)Morton Conrez 510 (25% solution)	7.45	63.50	7.27
11)AC-325 Nonionic (35%)	4.01	34.18	4.08
12)E-43 Nonionic (40%)	3.51	29.92	3.56

Procedure:

With good agitation, add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 74/10/16
Typical pH: 8.0
Formulation Density: 8.52 lbs./gal.
Specific Gravity: 1.023

Typical Density Values:

Solids: 25%:
Pounds/Gal.: 8.57
Specific Gravity: 1.029
Solids: 20%:
Pounds/Gal.: 8.52
Specific Gravity: 1.023
Solids: 15%:
Pounds/Gal.: 8.47
Specific Gravity: 1.017

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-870-389

Floor Polish
ML-870-403 20% Solids

Use with low speed spray buffing and high speed maintenance programs. Maintains a high initial gloss and can be burnished on an intermittent schedule. Excellent application and lay-down properties. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	46.18	393.95	47.29
2) Diethylene Glycol Monoethyl Ether	3.56	30.37	3.68
3) Tributyoxethyl Phosphate	1.44	12.28	1.44
4) Dibutyl Phthalate	1.29	11.00	1.26
5) Ethylene Glycol	1.48	12.63	1.37
6) Ammonium Hydroxide (28%)	0.20	1.71	0.23
7) Igepal CO-977	0.20	1.71	0.19
8) Fluorad FC-129 (1% solution)	0.59	5.03	0.60
9) Antifoam*	0.02	0.17	0.02
10)Proxel GXL	0.10	0.85	0.09
11)ML-870 Latex (38%)	34.52	294.48	33.50
12)Morton Conrez 40 (40%)	4.60	39.24	4.41
13)AC-325 Nonionic (35%)	4.04	34.46	4.11
14)E-43 Nonionic (40%)	1.78	15.19	1.81

Procedures:

With good agitation add the components in the order listed. After the addition of item #10, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 77/11/12
Typical pH: 8.6
Formulation Density: 8.53 lbs./gal.
Specific Gravity: 1.024

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.58
Specific gravity: 1.030
Solids: 20%:
Pounds/gal: 8.53
Specific gravity: 1.024
Solids: 15%:
Pounds/gal: 8.48
Specific gravity: 1.018

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-870-403

Floor Polish
ML-877-409 20% Solids

Use with low speed spray buffing and high speed maintenance programs. Maintains a high initial gloss and can be burnished on an intermittent schedule. Exceptional application, lay-down and recoat properties. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application are suggested with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	42.36	361.06	43.36
2) Diethylene Glycol Monoethyl Ether	4.97	42.36	5.13
3) Tributoxyethyl Phosphate	1.24	10.57	1.24
4) Dibutyl Phthalate	0.65	5.54	0.63
5) Igepal CO-977	0.20	1.70	0.18
6) Fluorad FC-129 (1% solution)	0.60	5.11	0.61
7) Antifoam*	0.02	0.17	0.02
8) Proxel GXL	0.10	0.85	0.09
9) ML-877 Latex (38%)	34.89	297.39	33.83
10)Morton Conrez 510 (25% solution)	7.45	63.50	7.27
11)AC-325 Nonionic (35%)	4.01	34.18	4.08
12)E-43 Nonionic (40%)	3.51	29.92	3.56

Procedure:

With good agitation add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 74/10/16
Typical pH: 8.5
Formulation Density: 8.52 lbs./gal.
Specific Gravity: 1.023

Typical Density Values:

Solids: 25%:
- Pounds/gal: 8.57
- Specific gravity: 1.029

Solids: 20%:
- Pounds/gal: 8.52
- Specific gravity: 1.023

Solids: 15%:
- Pounds/gal: 8.47
- Specific gravity: 1.017

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-877-409

Floor Polish
ML-877-421 20% Solids

Use with low speed spray buffing and high speed maintenance programs. Maintains a high initial gloss and can be burnished on an intermittent schedule. Excellent recoat and application properties. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	43.04	366.88	44.04
2) Diethylene Glycol Monoethyl Ether	4.10	34.95	4.24
3) Tributoxyethyl Phosphate	1.40	11.93	1.40
4) Dibutyl Phthalate	0.48	4.09	0.47
5) Fluorad FC-129 (1% solution)	0.60	5.11	0.61
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.85	0.09
8) ML-877 Latex (38%)	35.27	300.64	34.20
9) Morton Conrez 510 (25% solution)	7.49	63.85	7.31
10)AC-325 Nonionic (35%)	4.00	34.10	4.07
11)E-43 Nonionic (40%)	3.50	29.83	3.55

Procedure:

With good agitation add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 75/10/15
Typical pH: 8.0
Formulation Density: 8.52 lbs./gal.
Specific Gravity: 1.023

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.57
Specific gravity: 1.029
Solids: 20%:
Pounds/gal: 8.52
Specific gravity: 1.023
Solids: 15%:
Pounds/gal: 8.48
Specific gravity: 1.017

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-877-421

Floor Polish
Mor-Flo 16-420 20% Solids

Use with low speed spray buffing maintenance programs. Maintains a high initial gloss and can be recoated rapidly. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to seven coats per application may be applied with 25-40 min. drying time derending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	43.78	374.28	44.92
2) Diethylene Glycol Monoethyl Ether	4.55	38.90	4.72
3) Tributoxyethyl Phosphate	1.18	10.09	1.19
4) Dibutyl Phthalate	0.54	4.62	0.53
5) Fluorad FC-129 (1% solution)	0.62	5.30	0.63
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.85	0.09
8) Mor-Flo 16 Latex (40%)	32.78	280.24	31.49
9) Morton Conrez 510 (25% solution)	8.20	70.10	8.02
10)AC-325 Nonionic (35%)	4.39	37.53	4.48
11)E-43 Nonionic (40%)	3.84	32.83	3.91

Procedure:

With good agitation add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 72/11/17
Typical pH: 9.0
Formulation Density: 8.55 lbs./gal.
Specific Gravity: 1.026

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.61
Specific gravity: 1.033
Solids: 20%:
Pounds/gal: 8.55
Specific gravity: 1.026
Solids: 15%:
Pounds/gal: 8.49
Specific gravity: 1.020

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula MOR-FLO 16-420

Floor Polish
Mor-Glo 2-396 20% Solids

Use with low speed spray buffing and high speed maintenance programs. Maintains a high initial gloss and can be burnished daily or on an intermittent schedule without producing excessive amounts of dust. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to three coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	43.90	375.70	45.10
2) Diethylene Glycol Monoethyl Ether	5.28	45.19	5.48
3) Tributoxyethyl Phosphate	1.31	11.21	1.32
4) Dibutyl Phthalate	0.70	5.99	0.69
5) Igepal CO 977	0.45	3.85	0.42
6) Fluorad FC-129 (1% solution)	0.55	4.71	0.56
7) Antifoam*	0.02	0.17	0.02
8) Proxel GXL	0.10	0.86	0.09
9) Mor-Glo 2 Latex (38%)	39.43	337.45	38.04
10)Morton Conrez 510 (25% solution)	3.52	30.12	3.45
11)AC-325 Nonionic (35%)	2.53	21.65	2.58
12)E-43 Nonionic (40%)	2.21	18.91	2.25

Procedure:

With good agitation add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 85/5/10
Typical pH: 8.9
Formulation Density: 8.56 lbs./gal.
Specific Gravity: 1.027

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.62
Specific gravity: 1.034
Solids: 20%:
Pounds/gal: 8.56
Specific gravity: 1.027
Solids: 15%:
Pounds/gal: 8.50
Specific gravity: 1.020

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula MOR-GLO 2-396

Floor Polish Concentrate
Mor-Glo 2-PC-1 35% Solids

This is a floor polish concentrate and must be diluted with water before use. A simple 1:1 volume dilution with water will produce a 17.9% solids floor polish. Use with low speed spray buffing and high speed maintenance programs. Can be burnished daily or on an intermittent schedule. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to three coats per application are suggested with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Mor-Glo 2 Latex (38%)	74.29	649.07	73.18
2) Water	1.86	16.25	1.95
3) Diethylene Glycol Monoethyl Ether	9.99	87.28	10.58
4) Tributoxyethyl Phosphate	2.66	23.24	2.73
5) Igepal CO 977	0.96	8.39	0.91
6) Fluorad FC-129 (1% solution)	1.03	9.00	1.07
7) Antifoam*	0.03	0.26	0.03
8) Proxel GXL	0.15	1.31	0.14
9) AC-325 Nonionic (35%)	4.89	42.72	5.10
10)E-43 Nonionic (40%)	4.14	36.17	4.31

Procedure:

With good agitation add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 89/0/11
Typical pH: 8.5
Formulation Density: 8.74 lbs./gal.
Specific Gravity: 1.049

Typical Density Values:

Solids: 25%:
- Pounds/gal: 8.62
- Specific gravity: 1.034

Solids: 20%:
- Pounds/gal: 8.56
- Specific gravity: 1.027

Solids: 15%:
- Pounds/gal: 8.50
- Specific gravity: 1.020

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula MOR-GLO 2-PC-1

Floor Polish
Mor-Glo 4-377 20% Solids

[redacted]

Floor Sealer
AA-417-S1 18% Solids

Use as a base coat sealer on porous, resilient flooring surfaces. Polishes applied over AA-417-S1 will not soak into the floor surface and therefore build gloss with fewer coats. The sealer is not affected by ordinary stripping solutions. This allows polish coats to be removed while leaving the sealer intact. Up to two coats per application are suggested and may be applied with 25-40 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	53.61	452.11	54.27
2) Diethylene Glycol Monoethyl Ether	4.69	39.55	4.79
3) Tributoxyethyl Phosphate	2.39	20.16	2.37
4) Dibutyl Phthalate	0.60	5.06	0.58
5) Fluorad FC-129 (1% solution)	1.20	10.12	1.21
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.84	0.09
8) AA-417 Latex (40%)	37.39	315.32	36.67

Procedure:

With good agitation add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 9.0
Formulation Density: 8.43 lbs./gal.
Specific Gravity: 1.012

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.47
Specific gravity: 1.017
Solids: 20%:
Pounds/gal: 8.44
Specific gravity: 1.014
Solids: 15%:
Pounds/gal: 8.42
Specific gravity: 1.010

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Floor Sealer Formula

Floor Sealer
AA-417-S2 18% Solids

Use as a base coat sealer on porous, resilient flooring surfaces or as a sealer top coat on nonresilient surfaces. Incorporation of the wax emulsion will reduce surface black marking. The sealer is not affected by ordinary stripping solutions. This allows polish coats to be removed while leaving the sealer intact. Up to two or more coats per application are suggested depending on the floor surface and desired effect. They may be applied with 25-40 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	52.97	446.19	53.56
2) Diethylene Glycol Monoethyl Ether	4.09	34.45	4.18
3) Tributoxyethyl Phosphate	2.09	17.60	2.07
4) Dibutyl Phthalate	0.52	4.38	0.50
5) Fluorad FC-129 (1% solution)	1.04	8.76	1.05
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.84	0.09
8) AA-417 Latex (40%)	32.64	274.94	31.97
9) AC-325 Nonionic (35%)	6.53	55.00	6.56

Procedure:

With good agitation, add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax ratio: 85/0/15
Typical pH: 9.0
Formulation Density: 8.42 lbs./gal.
Specific Gravity: 1.011

Typical Density Values:

Solids: 25%:
Pounds/Gal.: 8.46
Specific Gravity: 1.016
Solids: 20%:
Pounds/Gal.: 8.43
Specific Gravity: 1.012
Solids: 15%:
Pounds/Gal.: 8.41
Specific Gravity: 1.009

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Floor Sealer Formula

High Speed Floor Coating
ML-870-414 20% Solids

Use with high speed maintenance programs where extremely high levels of gloss and appearance are desired. Can be burnished daily or on an intermittent schedule without producing excessive amounts of dust. Exceptional application and lay-down characteristics. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to seven coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	43.98	375.50	45.07
2) Diethylene Glycol Monoethyl Ether	6.72	57.38	6.96
3) Tributoxyethyl Phosphate	1.61	13.75	1.62
4) Dibutyl Phthalate	0.80	6.83	0.78
5) Fluorad FC-129 (1% solution)	0.60	5.12	0.61
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.85	0.09
8) ML-870 Latex (38%)	46.17	394.20	44.85

Procedure:

With good agitation add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 8.0
Formulation Density: 8.54 lbs./gal.
Specific Gravity: 1.025

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.59
Specific gravity: 1.031
Solids: 20%:
Pounds/gal: 8.54
Specific gravity: 1.025
Solids: 15%:
Pounds/gal: 8.49
Specific gravity: 1.019

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-870-414

Mop-On Restorer Concentrate
Mor-Flo 430-MI 16% Solids

Mor-Flo 430-M1 is a restorer concentrate formulation which can be easily diluted with water to form a "ready-to-use" solution. Recommended for mop-on applications where high and ultra-speed maintenance procedures are used. Since the restorer is a film former, floors should be clean and free of embedded soil prior to application. Application of the restorer fills small scratches and enhances gloss. The coating may be burnished after drying.

Components	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	45.53	384.81	46.20
2) Diethylene Glycol Monoethyl Ether	11.05	93.39	11.32
3) Tergitol TMN-6	0.87	7.35	0.86
4) Mor-Flo 430 Latex (36%)	42.26	357.17	41.29
5) Ammonium Hydroxide (28%)	0.29	2.45	0.33

Procedure:

With good agitation, add the components in the order listed. After the addition of item #3, allow to mix for 15 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 9.0
Formulation Density: 8.45 lbs./gal.
Specific Gravity: 1.015

Suggested End Use Dilution:

Mor-Flo 430 (16% solids): 1 part by volume
Water: 2-4 parts by volume

Properties of Ready-to-Use Solution:

Dilution Ratio (S1/Water): 1:2
- Density (lbs./gal.): 8.37
- Specific gravity: 1.005
- Solids: 5.4%

Dilution Ratio (S1/Water): 1:3
- Density (lbs./gal.): 8.36
- Specific gravity: 1.004
- Solids: 4.0%

Dilution Ratio (S1/Water): 1:4
- Density (lbs./gal.): 8.35
- Specific gravity: 1.003
- Solids: 3.2%

Note: The concentrate formulation may be modified to fit specific needs with components such as fragrances, colorants, and leveling surfactants.

SOURCE: Morton International: Restorer Concentrate Formula

Nonresilient Sealer
AA-421-S1A 20% Solids

Use as a base coat sealer on nonresilient mineral surfaces such as dimensional stone and concrete. AA-421 based products are intended for interior use only. Two or more coats per application are suggested and may be applied with 30-45 min. drying time depending on solids and conditions. This formulation includes leveling surfactant and antifoam emulsion.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	46.82	396.59	47.60
2) Fluorad FC-129 (1% solution)	0.60	5.08	0.61
3) Antifoam*	0.02	0.17	0.02
4) AA-421 Latex (38%)	52.56	445.22	51.77

Procedure:

With good agitation, add the components in the order listed. After the addition of item #3, allow to mix for 15 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 8.5
Formulation Density: 8.47 lbs./gal.
Specific Gravity: 1.017

Typical Density Values:

Solids: 25%:
Pounds/Gal.: 8.51
Specific Gravity: 1.021
Solids: 20%:
Pounds/Gal.: 8.47
Specific Gravity: 1.017
Solids: 15%:
Pounds/Gal.: 8.44
Specific Gravity: 1.013

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Sealer Formulation

Non-Zinc Floor Polish
NM-90-410 20% Solids

Use with low speed spray buffing and high speed maintenance programs. Maintains a high initial gloss and can be burnished on an intermittent schedule. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	42.48	362.21	43.48
2) Diethylene Glycol Monoethyl Ether	5.34	45.53	5.52
3) Tributoxyethyl Phosphate	1.40	11.94	1.40
4) Dibutyl Phthalate	0.60	5.12	0.59
5) Fluorad FC-129 (1% solution)	0.65	5.54	0.66
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.85	0.09
8) NM-90 Latex (38%)	37.48	319.57	36.36
9) Morton Conrez 510 (25% solution)	5.99	51.07	5.84
10)AC-325 Nonionic (35%)	3.19	27.20	3.25
11)E-43 Nonionic (40%)	2.75	23.45	2.79

Procedure:

With good agitation add the components in the order listed. After the addition of #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 80/8/12
Typical pH: 8.0
Formulation Density: 8.53 lbs./gal.
Specific Gravity: 1.024

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.58
Specific gravity: 1.030
Solids: 20%:
Pounds/gal: 8.52
Specific gravity: 1.023
Solids: 15%:
Pounds/gal: 8.48
Specific gravity: 1.018

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula NM-90-410

Non-Zinc Floor Polish
NM-91-418 20% Solids

Use with low speed spray buffing and high speed maintenance programs. Maintains a high initial gloss and can be burnished on an intermittent schedule. Excellent recoat and application characteristics. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	43.04	366.59	44.01
2) Diethylene Glycol Monoethyl Ether	4.10	34.92	4.23
3) Tributoxyethyl Phosphate	1.40	11.92	1.40
4) Dibutyl Phthalate	0.48	4.09	0.47
5) Fluorad FC-129 (1% solution)	0.60	5.11	0.61
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.85	0.09
8) NM-91 Latex (38%)	35.27	300.41	34.25
9) Morton Conrez 510 (25% solution)	7.49	63.80	7.30
10)AC-325 Nonionic (35%)	4.00	34.07	4.07
11)E-43 Nonionic (40%)	3.50	29.81	3.55

Procedure:

With good agitation add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 75/10/15
Typical pH: 8.0
Formulation Density: 8.52 lbs./gal.
Specific Gravity: 1.023

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.57
Specific gravity: 1.028
Solids: 20%:
Pounds/gal: 8.51
Specific gravity: 1.022
Solids: 15%:
Pounds/gal: 8.47
Specific gravity: 1.017

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula NM-91-418

Non-Zinc Floor Polish
NM-91-419 20% Solids

Use with low speed spray buffing and high speed maintenance programs. Maintains a high initial gloss and can be burnished on an intermittent schedule. Excellent recoat and application characteristics, especially in areas of low humidity. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	42.48	361.91	43.46
2) Diethylene Glycol Monoethyl Ether	5.34	45.49	5.51
3) Tributoxyethyl Phosphate	1.40	11.93	1.40
4) Dibutyl Phthalate	0.60	5.11	0.58
5) Fluorad FC-129 (1% solution)	0.65	5.54	0.66
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.85	0.09
8) NM-91 Latex (38%)	37.48	319.31	36.41
9) Morton Conrez 510 (25% solution)	5.99	51.03	5.84
10)AC-325 Nonionic (35%)	3.19	27.18	3.24
11)E-43 Nonionic (40%)	2.75	23.43	2.79

Procedure:

With good agitation add the components in the order listed. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 80/8/12
Typical pH: 8.0
Formulation Density: 8.52 lbs./gal.
Specific Gravity: 1.023

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.57
Specific gravity: 1.029
Solids: 20%:
Pounds/gal: 8.52
Specific gravity: 1.023
Solids: 15%:
Pounds/gal: 8.47
Specific gravity: 1.017

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula NM-91-419

Non-Zinc Floor Polish
NM-128-428 20% Solids

Use with low-speed spray buffing or high-speed maintenance programs. Maintains a high initial gloss. Ideal for daily burnishing programs. Very responsive to both electric and propane machines. Will maintain high level of appearance over an extended period. Up to five coats per application may be applied with 20-30 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	48.00	411.70	49.44
2) Diethylene Glycol Monoethyl Ether	2.64	22.64	2.74
3) Tributoxyethyl Phosphate	1.55	13.29	1.56
4) Dibutyl Phthalate	0.80	6.86	0.78
5) Fluorad FC-129 (1% solution)	0.55	4.72	0.56
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.86	0.09
8) NM-128 Latex (38%)	46.34	397.46	44.81

Procedure:
With good agitation, add the components in the order listed above. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining component slowly.

Formulation Constants:
Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 8.0
Formulation Density: 8.58 lbs./gal.
Specific Gravity: 1.030

Typical Density Values:
Solids: 25%:
Pounds/Gal.: 8.64
Specific Gravity: 1.037
Solids: 20%:
Pounds/Gal.: 8.58
Specific Gravity: 1.030
Solids: 15%:
Pounds/Gal.: 8.51
Specific Gravity: 1.022

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula NM-128-428

Non-Zinc Floor Polish
NM-128-433 20% Solids

Use with low-speed spray buffing or high-speed maintenance programs. Maintains a high initial gloss and can be burnished daily or on an intermittent schedule. Very responsive to both electric and propane machines. Wax addition improves scratch resistance. A consistent high level of appearance can be sustained over an extended period. Up to five coats per application may be applied with 20-30 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	47.86	410.22	49.25
2) Diethylene Glycol Monoethyl Ether	2.57	22.03	2.67
3) Tributoxyethyl Phosphate	1.51	12.94	1.52
4) Dibutyl Phthalate	0.78	6.69	0.77
5) Fluorad FC-129 (1% solution)	0.54	4.63	0.55
6) Antifoam*	0.02	0.17	0.02
7) Proxel GXL	0.10	0.86	0.09
8) NM-128 Latex (38%)	45.16	387.08	43.64
9) AC-325 Nonionic (35%)	1.46	12.51	1.49

Procedure:

With good agitation, add the components in the order listed above. After the addition of item #7, allow to mix for 30 minutes before continuing. Add the remaining component slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 97/0/3
Typical pH: 8.0
Formulation Density: 8.57 lbs./gal.
Specific Gravity: 1.029

Typical Density Values:

Solids: 25%:
Pounds/Gal.: 8.63
Specific Gravity: 1.036
Solids: 20%:
Pounds/Gal.: 8.57
Specific Gravity: 1.0290
Solids: 15%:
Pounds/Gal.: 8.51
Specific Gravity: 1.022

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula NM-128-433

Removable Sealer
ML-870-S1 18% Solids

For use on resilient floor surfaces where a permanent type sealer is not desired. Forms a good base coat for subsequent application of polish coats. ML-870-S1 will be easily removed during normal stripping operations. One-two coats per application are suggested and may be applied with 30-45 min. drying time depending on solids and conditions.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	47.55	405.50	48.69
2) Diethylene Glycol Monoethyl Ether	5.20	44.35	5.38
3) Tributoxyethyl Phosphate	1.30	11.09	1.30
4) Dibutyl Phthalate	0.68	5.80	0.66
5) Igepal CO 977	0.21	1.79	0.19
6) Fluorad FC-129 (1% solution)	0.62	5.29	0.63
7) Antifoam*	0.02	0.17	0.02
8) Proxel GXL	0.10	0.85	0.09
9) ML-870 Latex (38%)	36.52	311.44	35.43
10)Morton Conrez 510 (25% solution)	7.80	66.52	7.61

Procedure:

With good agitation add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 88/12/0
Typical pH: 8.5
Formulation Density: 8.53 lbs./gal.
Specific Gravity: 1.024

Typical Density Values:

Solids: 25%:
Pounds/gal: 8.61
Specific gravity: 1.033
Solids: 20%:
Pounds/gal: 8.55
Specific gravity: 1.026
Solids: 15%:
Pounds/gal: 8.49
Specific gravity: 1.020

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formula ML-870-S1

Silver and Metal Polish

Formulation CP7-0024 produces a cleaner-polish that is easy to apply and provides long lasting protection against water spotting and staining.

Part:	Ingredients	Percent by Weight
A	200 Silicone Fluid by Dow Corning, 350 cs.	1.0
	Dow Corning 20 Release Coating	2.0
	Stoddard Solvent	20.0
	Lauric Acid (96%)	2.0
B	Morpholine	1.0
	Ammonium Hydroxide (28%)	1.0
	Water	16.0
C	Carbopol 934	0.2
	Water	40.8
D	Snow Floss	14.0

Preparation:
1. Load Part A into vessel while mixing on a high-shear mixer.
2. Add Part B while continuing to mix.
3. Add Part C and then Part D and continue to mix until uniform.

Formulation CP7-0024

Aerosol Appliance Polish

Formulation CP7-0227 is a water-in-oil emulsion polish which produces a high gloss, no smear, hard film when applied to Formica, as well as most kitchen appliances.

The concentrate formulation can be applied as a liquid polish.

Aerosol Concentrate:

Part:	Ingredients	Percent by Weight
A	200 Silicone Fluid by Dow Corning, 350 cs.	4.0
	Witcamide 511	1.0
	Carnauba Wax #3	1.0
	Isopar K	34.0
B	Water	60.0

Suggested Aerosol Formulation:

Ingredient:	Percent by Weight
Concentrate CP7-0227	80
Propellant of choice	20

Preparation:
1. Heat mixture of Part A ingredients to 80C (176F)-melt wax.
2. Heat water to 80C (176F).
3. Add water slowly to Part A mixture with high speed agitation.
4. Continue stirring while cooling to room temperature.
5. Package aerosol.

SOURCE: Dow Corning Corp.: Formulation CP7-0227

Spray Buff Concentrate
Mor-Flo 424-S1 16% Solids

Mor-Flo 424-S1 is a solvent based, spray buff concentrate which can be easily diluted with water to form a "ready-to-use" spray buff solution. Recommended for spray application, Mor-Flo 424-S1 systems work well with both low and high speed maintenance practices. The incorporation of mineral spirits makes this system ideal for removal of tar spots, such as from parking lots, and black heel marks.

Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1) Water	54.73	450.29	54.05
2) Diethylene Glycol Monoethyl Ether	4.00	32.91	3.99
3) Igepal CO 430	6.40	52.66	6.20
4) Mor-Flo 424 Latex (36%)	26.68	219.51	25.38
5) Odorless Mineral Spirits	7.99	65.74	10.16
6) Ammonium Hydroxide (28%)	0.20	1.65	0.22

Procedure:

With good agitation add the components in the order listed. After the addition of item #3 allow to mix for 15 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 9.0
Formulation Density: 8.23 lbs./gal.
Specific Gravity: 0.988

Suggested End Use Dilution:

Mor-Flo 424-S1 (16% solids): 1 part by volume
Water: 2 parts by volume

Properties of Ready to Use Solution:

Density: 8.3 lbs./gal.
Specific gravity: 0.996
Solids: 5.3%

Note: Due to differences between various sources of mineral spirits, Morton cannot indicate a flash point for the S1 formulation or the ready to use dilution. It is suggested that flash points be determined on customer prepared samples.

SOURCE: Morton International: Spray Buff Concentrate Formula

Urethane Modified Sealer
Mor-Flo CS-38-S1 18% Solids

Mor-Flo CS-38-S1 is a polyurethane modified acrylic concrete sealer. A simple water dilution and the addition of a preservative will produce a ready-to-use product. Leveling and wetting on tightly troweled concrete or other extremely smooth surfaces can be improved by the addition of 0.5% Fluorad FC-129 (1% active solution). Foaming, which may be a problem depending on the application method, can be greatly reduced by adding 0.03% of an antifoam emulsion (2).

Item:	Components:	Weight Percent	Pounds/ 100 Gals.	Gallons
1	Water	52.63	445.06	53.43
2	Proxel GXL	0.07	0.59	0.06
3	Mor-Flo CS-38 Latex (38%)	47.30	399.98	46.51

Procedure:

With good agitation, add the components in the order listed. After the addition of item #2, allow to mix for 5 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 100/0/0
Typical pH: 8.0
Formulation Density: 8.46 lbs./gal.
Specific Gravity: 1.015

Typical Density Values:

Solids: 25%:
Pounds/Gal.: 8.51
Specific Gravity: 1.021
Solids: 20%:
Pounds/Gal.: 8.47
Specific Gravity: 1.017
Solids: 15%:
Pounds/Gal.: 8.44
Specific Gravity: 1.013

* SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Sealer Formulation

11. Rinse Aids

Dishwasher Rinse Aid

Hamposyl L-30	7%
Triton CF-21	48%
Water	45%

Dishwasher Rinse Aid

Hamposyl L-30	7%
Triton CF-10	23%
Triton CF-21	23%
Water	47%

Dishwasher Rinse Aid

Hamposyl L-30	5%
Triton CF-54	50%
Water	45%

Dishwasher Rinse Aids are formulated from the Hamposyl sarcosinates and low-foam nonionics. The sarcosinate surfactant raises the cloud point and solubility of the nonionic and increases wetting action without contributing added foam.

Source: W.R. Grace & Co.-Conn.: HAMPSHIRE Hamposyl Surfactants: Formulas

Dishwasher Rinse Aid

	%
Poly-Tergent SLF-18	38
Sodium naphthalenesulfonate	2
Water	60

SOURCE: Olin Chemicals: POLY-TERGENT Surfactants: Formulas

Rinse Aid

Ingredients:	% by Wt.
Makon NF-5	50.0
Isopropyl alcohol	6.0
Water, D.I.	44.0

Mixing Procedure:
Charge tank with soft water. Add IPA and mix. Add Makon NF-5 last while under agitation.

Properties:
Appearance: Clear liquid
Solids, %: 50
Cloud point, F: 48

Use Instructions:
Use at a concentration to give 50-200 ppm.

Performance:
Low foaming, excellent wetting, rapid drainage with no break in the water film, good dispersability at use temperatures. Leaves surfaces sparkling and spot-free.
Formulation No. 278

Rinse Aid

Ingredients:	% by Wt.
Makon NF-5	50.0
Stepanate SXS	15.0
Water, D.I.	35.0

Mixing Procedure:
Charge tank with water. Add Stepanate SXS and mix. Add Makon NF-5 last while under agitation.

Properties:
Appearance: Clear liquid
Solids, %: 56
Cloud point, F: 76

Use Instructions:
Use at a concentration of 50-200 ppm.

Performance:
Low foaming, excellent wetting, rapid drainage with no break in the water film. Good dispersability at use temperatures. Leaves surfaces sparkling and spot-free.
Formulation No. 305

SOURCE: Stepan Co.: Formulations

12. Rug, Carpet and Upholstery Shampoos and Cleaners

BTC 99/824 Carpet Cleaner/Deodorizer (Extraction)

Ingredients:	% by Wt.
Water	76.5
Bio-Terge PAS-8S	6.0
Makon 10	3.0
EDTA (38%)	2.5
Dowanol DB or Butyl Carbitol	8.0
BTC 99 (50% active) EPA Reg. No. 1839-128	2.8
BTC 824 (50% active) EPA Reg. No. 1839-23	1.2

Mixing Procedure:
Charge vessel with water and add ingredients in order shown while mixing to obtain a homogeneous solution.

Properties:
Appearance: Clear liquid
pH, as is: 11.3
Density, lbs/gal: 8.42
Viscosity @ 25C: Water thin

Use Instructions:
Carpet Deodorization: 2 oz. per gallon of water. Apply with carpet extraction machine.
Note: As of 6/30/92, EPA Registration is pending for a sanitization claim for this formulation.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comment:
EPA Registration is pending as of 3/2/90.
Formulation No. 511

Carpet Prespotter

Ingredients:	% by Wt.
Water, D.I.	94.34
Dowanol DPM	2.40
Dowanol PM	1.60
Stepanol WAC	1.50
Ammonyx LO	0.16

Mixing Procedure:
Mix ingredients in the order shown above.

Properties:
Appearance: Clear, colorless liquid
pH, as is: 8.9
Viscosity @ 25C, cps: 2
Cloud point: <40F

Use Instructions:
Spray as is from spray bottle onto soiled area
Formulation No. 39

SOURCE: Stepan Co.: Formulations

Carpet Cleaner ("Steam" Extraction)

Ingredients:	% by Wt.
Water	76.0
Na4EDTA	4.0
Dowanol PM (Glycol ether)	4.0
Bio-Terge PAS-8S	16.0

Mixing Procedure:
Blend ingredients in the order given
Properties:
Appearance: Cloudy liquid
pH, as is: 8.7
Viscosity @ 25C, cps: <15
Active, %: 13.6
Use Instructions:
Dilute 1 to 4 ozs per gallon of water
Comment:
Generater moderate amount of foam
Minimizes build-up of foam in holding tank
Dries to a crisp friable powder
Formulation No. 130

Carpet Cleaner ("Steam" Extraction)

Ingredients:	% by Wt.
Water	70.0
Dowanol PM (Glycol ether)	4.0
Triethanolamine	10.0
Bio-Terge PAS-8S	16.0

Mixing Procedure:
Blend ingredients in the order given
Properties:
Appearance: Clear liquid
pH, as is: 10.2
Viscosity @ 25C, cps: <25
Active, %: 19.6
Use Instructions:
Dilute 1 to 4 ozs in one gallon of water.
Comment:
Generater moderate amount of foam
Minimizes build-up of foam in holding tank
Dries to a crisp friable powder
Formulation No. 131

SOURCE: Stepan Co.: Formulations

Carpet Shampoo (Liquid)

Soil: Food (fat and protein), petroleum oil and grease, clay and particulate
Surface: Polyester and nylon
Application Method: Rug scrubber
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	62.5
TSP	2.0
STPP	5.0
Kasil #6	20.0
*Phosphate Ester	3.0
**Sodium Alkylnaphthalene Sulfonate	3.5
***Octylphenoxy Polyethoxyethanol, 7-8 Moles EO	4.0

Use Dilution: 0.8-1.5% bw (1-2 oz/gallon)
*Mona Industries, Rohm & Haas
**DeSoto
***Rohm & Haas, GAF

Rug Steam Cleaner (Liquid)

Soil: Food (fat and protein), petroleum oil and grease, clay and particulate
Surface: Polyester and nylon
Application Method: Rug scrubber
Manufacture: Mix tank with propeller stirrer

Composition:	% wt
Water	79.6
Metso Beads 2048	7.8
Sodium Xylene Sulfonate, 40%	8.7
*C12-C15 Linear Alcohol, 12 Moles EO	3.9

Use Dilution: 4.7-9.4% bw (6-12 oz/gallon)
*Shell, Union Carbide, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Extraction Type Low Foam Carpet Shampoo

Ingredients:	% wt/wt
Amphoterge KJ-2	5.0
Tetrapotassium pyrophosphate	5.0
Ethylene diamine tetraacetic acid, tetrasodium salt (38% sol'n)	5.0
Sodium sesquicarbonate	5.0
Water	80.0

Preparative Procedure:

Charge the mixing vessel with all of the water. While mixing, add the tetrapotassium pyrophosphate, EDTA Na4, and sodium sesquicarbonate to the water. Mix until the system clears; then add the Amphoterge KJ-2. Continue to mix until the solution clears.

SOURCE: Lonza Inc.: Formula D-107-3

Rug Shampoo

Amine soaps or synthetic detergents plus a solvent coupling agent act as excellent shampoos for cleaning rugs and upholstered furniture. The copious lather produced with water solutions of these shampoos washes easily, does not harm the fabric, and leaves the colors clear and bright. Use a sponge or soft cloth as an applicator. Press the excess liquid from the applicator, work up a lather on it, and rub the surface to be cleaned. Remove the soap by rubbing cleaned surface with a clean cloth which has been wet with warm water. Wipe the surface with a clean dry cloth to remove the water. It is best to complete a small area at a time.

Amine Soap:	lbs.
Oleic Acid	23.5
Coconut-Oil Fatty Acids	17.5
Isopropanol	25.0
Triethanolamine	11.8
Monoethanolamine	5.6
Surfonic N-95	4.2
Water	12.4

Mix the oleic acid, fatty acids, and isopropanol. Add the amines and Surfonic N-95 and stir until thoroughly mixed. Then add the water, which will produce a clear liquid. Dilute the concentrated detergent with an equal volume of hot water before use.

The formula is based on a combining weight for coconut-oil fatty acids of 210. The proportion should be changed according to the combining weight of the particular fatty acid to be used. All the triethanolamine may be replaced by an additional 5.6 pounds of monoethanolamine to increase the detergency of the shampoo.

Rug Shampoo

Raw Materials:	Parts by Weight
Oleic Acid	28.0
Coconut Oil Fatty Acid	21.0
Isopropanol, Anhydrous	30.0
Triethanolamine	14.0
Monoethanolamine	6.8
Surfonic N-95	5.0
Water	15.0

SOURCE: Texaco Chemical Co.: Formulas

Rug Steam Cleaners
Powder with Phosphate

	%w
Neodol 25-12	4.0
Sodium metasilicate, anhydrous basis	29.0
Sodium tripolyphosphate	15.0
Sodium sulfate	29.0
Sodium carbonate	23.0

Liquid Cleaner

	%w
Neodol 25-12	4.0
Sodium metasilicate, pentahydrate	8.0
Sodium xylene sulfonate (40%)	6.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 4
- Phase coalescence temp., F: >167
- pH: 11.9

Non-Phosphate Powder

	%w
Neodol 25-12	4.0
Sodium metasilicate, anhydrous	38.0
Sodium sulfate	25.0
Sodium carbonate	33.0

Blending Procedure for Powders Only:
Mix solid builders and filler thoroughly. Add surfactant slowly while mixing, mix thoroughly.

Rug and Upholstery Shampoos
Good Quality Liquid

	%w
Neodol 25-12	5.0
Sodium tripolyphosphate	2.0
Isopropyl alcohol	4.0
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 4
- Phase coalescence temp., F: >167
- pH: 8.8

Recommended Dilution:
- For rugs and carpet: 1 part cleaner to 10 parts water (12.8 oz./gal.).
- For use on upholstery: 1 part cleaner to 20 parts water (6.4 oz./gal.)

High-Foaming Liquid

	%w
Neodol 25-3S (60%)	21.7
Water, dye, perfume, fluorescent whitening agent(s)	to 100%

Properties:
- Viscosity, 73F, cps: 15
- Phase coalescence temp., F: >176
- pH: 8.7

Recommended Dilution:
1 part cleaner to 8 parts water (16 oz./gal.).

SOURCE: Shell Chemical Co.:NEODOL Starting Formulations:Formulas

Rug and Carpet Cleaner

	Wt. %
Water	86.0
Trisodium phosphate	2.0
Orvus K liquid	7.0
Dowanol PnB glycol ether	5.0

Notes: Combine first two components and stir to dissolve solids.
Add remaining components in order listed.
Cleaner should be clear and colorless.

Variations:
1) DPnB can be substituted directly for PnB.
2) A DPM/DPnB blend can be used with these changes:
DPM glycol ether: 2.5%
DPnB glycol ether: 2.5%
All other weight percentages remain the same.
Formula 17

Rug and Carpet Cleaner, Low Foam

	Wt. %
Dowfax 2A1 (45% solution) surfactant	7.0
Triethanolamine	10.0
Dowanol PM (or PnB) glycol ether	4.0
Potassium oleate	1.0
Water	78.0

Formula 18

Rug and Carpet Cleaner, Moderate Foam

	wt. %
Dowanol DPM (or PnB) glycol ether	5.0
Trisodium phosphate	2.0
Orvus K liquid	7.0
Water	86.0

Formula 19

Liquid Steam-Cleaner

	wt. %
Water	76.0
Versene 100 chelating agent	3.0
Sodium orthosilicate	4.5
Ninol 1285 alkylolamides	11.5
Dowanol PnB glycol ether	5.0

Formula 20

SOURCE: Dow Chemical Co.: DOWANOL Glycol Ethers: Formulas

Rug and Upholstery Cleaners
"Dry Brittle" Liquid Cleaners
High Quality

	%w
Neodol 25-12	13.0
Neodol 25-3S (60%)	9.0
Tetrapotassium pyrophosphate (a)	7.0
Phosphate ester (b)	6.0
Water, dye, perfume	to 100%

Properties
- Viscosity, 73F, cps: 13
- Phase coalescence temp., F: 150
- pH: 9.6

Good Quality

	%w
Neodol 25-12	6.0
C12 LAS (60%) (c)	1.7
Tetrapotassium pyrophosphate (a)	3.0
Sodium xylene sulfonate (40%)	1.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 2
- Phase coalescence temp., F: >165
- pH: 9.6

Economy

	%w
Neodol 25-12	4.0
Tetrapotassium pyrophosphate (a)	8.0
Sodium xylene sulfonate (40%)	2.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 3
- Phase coalescence temp., F: 125
- pH: 10

a) Can use 1%w sodium metasilicate in place of 1% of the phosphate if a more alkaline product is desired.
b) Triton H-66, Union Carbide Corp., or equivalent product.
c) Witconate 1260, Witco Corp., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

13. Miscellaneous

Acid CD Dairy Cleaner Sanitizer

Ingredients:		% by Wt.
Water		34.7
Phosphoric acid (85%)		35.3
BTC 2125M (50% active)	EPA Reg. No. 1839-46	20.0
Neutronyx 656		10.0

Mixing Procedure:
Charge vessel with water and add acid slowly. Allow acid mixture to cool before adding remaining ingredients in order shown while mixing.

Properties:
Appearance: Clear colorless, liquid
pH, as is: <1.0
Density, lbs/gal: 9.76
Viscosity @ 25C: Water thin

Use Instructions:
Bulk Milk Tanks: 1 oz. Acid CD per 4 gallons of warm (120F) water.
Milk Equipment: 1 oz. Acid CD per 4 gals. water.
Cow Udders: Use a clean single service towel for each cow to wipe udders with above solution (1 oz. Acid CD per 4 gals. water) prior to milking.
For complete use instructions, see EPA Registered Label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Dept. for subregistration package.

Comment:
Sanitizing activity at 1/500 dilution against S. Aureus in the presence of 600 mg/l (as CaCO3) hard water. Cleans and disperses in hard water up to 1700 mg/l (as CaCO3).
EPA Registration Number 1839-51

SOURCE: Stepan Co.: Formulation No. 328

Liquid Acid Dairy Sanitizer & Cleaner

	% by wt.
Miranol C2M-SF Conc. (adjusted to pH 7.0)	13.27
Triton X-100	6.63
Quaternary Ammonium Germicide, 50%	13.00
Glycolic Acid	17.00

Note: When diluted to contain from 100 to 200 ppm quaternary in water this formula has excellent hard water tolerance.

SOURCE: Miranol., Inc.: MIRANOL Products for Household/Industrial Applications: Formula

Acid Cleaners
Hydrofluoric Acid Type

	Wt%
Water	70.0
Tomah Acid Foamer	3.0
95% Sulfuric Acid	10.0
70% Hydrofluoric Acid	17.0

pH: 3.5
SpG: 1.099 @ 74F.
Wt./Gal.: 9.15 @ 74F.

Ammonium Bifluoride Type

	Wt%
Water	64.0
Tomah Acid Foamer	3.0
95% Sulfuric Acid	20.0
Ammonium Bifluoride	13.0

pH: 3.5
SpG: 1.099 @ 74F.
Wt./Gal.: 9.15 @ 74F.

Viscous Acid Cleaner

	Wt%
9.5% HCl Solution	97.0
Tomah Acid Thickener	3.0

pH: 1.3
SpG: 1.0493 @ 74F.
Wt./Gal.: 8.74 @ 74F.

Viscous Acid Cleaner
(Easy Mix Formula)

	Wt%
Water	70.6
75% Phosphoric Acid	2.0
Tomah Acid Thickener	3.0
37% HCl	24.4

pH: 1.3
SpG: 1.0493 @ 74F.
Wt./Gal.: 8.74 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Acid Cleaner with Corrosion Inhibitor

Ingredients:	% wt/wt
Amphoterge KJ-2	10.0
Unihib 305-LC	10.0
Phosphoric acid (85% sol'n.)	2.0
Gluconic acid (50% sol'n.)	1.0
Trisodium phosphate	1.0
Water	76.0

pH: 5.40
1:64 dil'n. pH: 5.00

Preparative Procedure:

With continuous agitation, add the trisodium phosphate to the water. When dissolution is complete, slowly add the gluconic and phosphoric acids. Add Amphoterge KJ-2 and Unihib 305-LC and continue agitation to a clear, uniform status.

Formula S-26-13

Heavy Duty Steam Cleaner

Ingredients:	% wt/wt
Amphoterge K	15.0
Sodium metasilicate pentahydrate	30.0
Potassium hydroxide (50% sol'n.)	10.0
Water	45.0

Preparative Procedure:

Charge the mixing vessel with all of the water. While mixing, add the sodium metasilicate. After the metasilicate has dissolved, add the sodium hydroxide solution and the Amphoterge K. Stir after the addition of each until a clear solution is obtained.

Note: Dissolution of the salt may be facilitated by heating to 40-50C.
This formulation should be stored in plastic as it will attack glass upon prolonged storage.

Formula M-1-1

Caustic Equipment Cleaner

Ingredients:	% wt/wt
Amphoterge J-2 (40% sol'n.)	12.5
Potassium hydroxide (45% sol'n.)	10.0
Kasil No. 1	50.0
Water	27.5

Preparative Procedure:

Charge the mixing vessel with all of the water. While mixing, add the potassium hydroxide followed by the Kasil No. 1. When a clear solution is obtained, add the Amphoterge J-2. Continue to stir for an additional 15 minutes to insure uniformity.

Formula M-50-4

SOURCE: Lonza, Inc.: Formulas

Alkaline Derusting Compound and Electrocleaner

Ingredients:	% by Wt.
Sodium carbonate, light density	26.0
Sodium gluconate	15.0
Na3 NTA or Na4 EDTA	2.0
Triethanolamine	2.0
Bio-Terge PAS-8S	4.0
Makon 10	1.0
Sodium hydroxide, beads or flakes	50.0

Mixing Procedure:
Absorb surfactants and TEA on sodium carbonate.
Add the remaining ingredients and mix for 1 minute.
Properties:
Appearance: White, free-flowing powder
pH, 1% aqueous: 13.0
Use Instructions:
10 oz/gal at 140-180F. Immerse parts to be cleaned in solution can be used with or without electrical current.
Comment:
Bio-Terge PAS-8S serves as a good, low-foaming surfactant and hydrotrope in above formulation.
Formulation No. 266

Metal Burnishing Compound

Ingredients:	% by Wt.
Ninol 11-CM	10.0
Na4EDTA	1.0
Cobratec 99	0.2
Water	88.8

Mixing Procedure:
Dissolve EDTA and Cobratec 99 in water. Add Ninol 11-CM slowly while mixing. Mix until clear.
Properties:
Appearance: Clear liquid
pH, as is: 10.0
Viscosity @ 25C, cps: 350
Use Instructions:
Dilute 1 to 2 ozs of product to one gallon of water
Comment:
Cleans and polishes all types of metals.
Formulation No. 488

SOURCE: Stepan Co.: Formulations

Alkaline Wax Stripper

Ingredients:	% wt/wt
Amphoterge KJ-2	10.0
Tetrapotassium pyrophosphate	10.0
Sodium metasilicate, pentahydrate	5.0
Water	75.0

Use-dilution: approx. 1:32

Preparative Procedure:

Charge all of the water and add, with agitation, the tetrapotassium pyrophosphate and sodium metasilicate pentahydrate. When they have been dissolved, add the Amphoterge KJ-2 and stir for 5 additional minutes before packaging.

SOURCE: Lonza Inc.: Formula X-51-2

Household & Industrial Cleaners Wallpaper Penetrant

Niaproof Anionic Surfactant 08 has been used successfully in formulations that eliminate much of the work involved in removing old wallpaper. To use the formulation shown below, dilute it with 6 or 7 parts water, apply it with a sponge or brush, and allow it to remain on the paper for several minutes. If it does not immediately penetrate and loosen the paper, application of more solution and the allowance of adequate time will produce the desired ease of removal.

Components:	Parts by Weight
Niaproof Anionic 08	12.5
Butyl Carbitol	12.5
Water	75.0

SOURCE: Niacet Corp.: NIAPROOF Anionic Surfactant 08

Economy Pine Cleaner

Component:	wt. %
Alfonic 810-60 Ethoxylate	10.0
Pine Oil	5.0
SXS or STXS*	9.4
Water, perfume, dye	q.s.

q.s.: quantity sufficient to make 100 percent

* 40% active

Properties:

Approximate pH: 6.5

Cloud/clear (F): below 40F

Order of Addition:

Water, SXS, Pine Oil, Alfonic 810-60

SOURCE: Vista Chemical Co.: Example Starting Formulation

Baking Pan Cleaner (Powder)

Soil: Animal fat and grease, vegetable oil
Surface: Aluminum and steel
Application Method: Immersion/brush
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Sodium Carbonate	35.0
STPP	12.0
*Nonylphenoxy Polyethoxyethanol, 9-10 moles EO	3.0
Metso Pentabead 20	50.0

Use Dilution: 1.5% bw (2 oz/gallon)
* Rohm & Haas, GAF

Food Industry Cleaner (Liquid)

Soil: Heavy food grease, oil and protein
Surface: Metal, ceramic, polymeric, glass
Application Method: Wipe, mop or brush
Manufacture: Mix tank with propeller stirrer

Composition:	% Wt
Water	74.0
TKPP (60%)	3.0
N Clear	7.0
Sodium Hydroxide (50%)	3.5
*Phosphate Ester	2.5
**Ethylene Glycol n-Butyl Ether	5.0
***C12-C13 Linear Alcohol, 6.5 Moles EO	5.0

Use Dilution: 6-12% bw (8-16 oz/gallon)
*Mona Industries, Rohm & Haas
**Dow, Union Carbide
***Shell, Union Carbide, Vista

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Bottle Washing Concentrate

	% by wt.
MIranol JEM Conc.	1.5
Igepal CO-730	0.5
Sodium Gluconate	20.0
Versene 100	5.0
Water	73.0

Note: This concentrate is to be metered into the caustic bottle washing solution. A suggested ratio is one part concentrate to one hundred parts of 6% sodium hydroxide solution. However, this ratio may be varied depending on individual requirements.

Bottle Wash Concentrate

	% by wt.
Mirawet ASC	2.5
Igepal CO-710	0.5
Sodium Gluconate	20.0
Versene 100	5.0
Water	72.0

Note: This concentrate is to be metered into the caustic solution at a ratio of about one part concentrate to one hundred parts of 6% NaOH.

SOURCE: Miranol, Inc.: Formulas

Powdered Bottle-Washing Compound

Ingredients:	Wt Percent
Triton QS-44	1.25
Organic Sequestering Agents	1.00
Sodium Hydroxide	97.75

SOURCE: Union Carbide Chemicals and Plastics Co., Inc.: TRITON QS-44: Formula

BTC 2125M-P40 Powdered Sanitizer

Ingredients:	% by Wt.
BTC 2125M (40% active) EPA Reg. No. 1839-55	100.0

Properties:
Appearance: White free-flowing powder
pH, 10% solution: 6.5-8.5
Density (lbs/cu ft): 34.3

Use Instructions:
Sanitization (food contact surfaces):
0.625 oz. per 10 gallons or
1.25 ozs. per 20 gallons
When used as directed, BTC 2125M P-40 Powdered Sanitizer is an effective sanitizer in hard water up to 750 ppm hardness (as $CaCO_3$).
Formulation can be packaged in pre-measured water soluble packages and used to sanitize mobile items, (such as drinking glasses & eating utensils).
When used at the recommended dosages, a potable water rinse is not required after sanitization. For complete use instructions, see EPA Registered Label.

Storage Stability:
Store in a cool dry place. Keep lid closed to prevent caking. Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA. Consult Stepan's Regulatory Dept. for subregistration package.
EPA Registration Number 1839-142

50% BTC 776 Swimming Pool Algaecide

Ingredients:	% by Wt.
BTC 776 (50% active) EPA. Reg. No. 1839-18	100.0

Properties:
Appearance: Clear liquid
pH, as is: 7.0
Density, lbs/gal: 8.00
Viscosity @ 25C, cps: 60

Use Instructions:
Initial Dose: 5.0 ozs. per 10000 gals. of pool water.
Periodic Maintenance Dose: 1.25 ozs. per 10000 gals of pool water.
For complete use instructions, see EPA Registered Label.

Storage Stability:
This formulation is freeze/thaw stable. It will return to its original state upon thawing.
Formulation is stable at 120F for 30 days.

Comments:
This formulation is registered with the Federal EPA.
EPA Registration Number 1839-141
Formulation No. 512

SOURCE: Stepan Co.: Formulations

Butyl Caustic Cleaner

Water	66.0 Wt.%
Trisodium NTA	1.0
Sodium Gluconate	1.0
42 Sodium Silicate 3.22/1	10.0
45% KOH	10.0
Butyl Cellosolve	5.0
Tomah Alkali Surfactant	5.0
Nonionic Surfactant	2.0

pH: 12.9
SpG: 1.165 @ 74F.
Wt./Gal.: 9.70 @ 74F.

Butyl Caustic Cleaner

Water	63.0 Wt.%
45% KOH	20.0
Sodium Gluconate	3.0
Butyl Cellosolve	8.0
Triton X-100	1.0
Tomah Alkali Surfactant	5.0

pH: 13.4
SpG: 1.095 @ 74F.
Wt./Gal.: 9.12 @ 74F.

Butyl/Caustic Cleaner

Water	63.0 Wt.%
45% KOH	8.0
Sodium Gluconate	2.0
42 Sodium Silicate 3.22/1	10.0
Butyl Cellosolve	10.0
Nonionic Surfactant	2.0
Tomah Alkali Surfactant	5.0

pH: 12.8
SpG: 1.082 @ 74F.
Wt./Gal.: 9.01 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Butyl Cleaner

	% by wt.
Miranol CM-SF Conc.	5.0
Dowanol EB	3.7
Igepal CO-630	2.0
Sodium Metasilicate Pentahydrate	4.0
Tetrapotassium Pyrophosphate	4.0
Water	81.3

"Butyl" Cleaner

	% by wt.
Miranol C2M-SF Conc.	5.0
Dowanol EB	10.0
Sodium Carbonate	2.0
Water	83.0

Alumimum Cleaner I

	% by wt.
Miranol C2M-SF Conc.	5.0-10.0
Sodium Metasilicate Pentahydrate	5.0- 5.0
Water	90.0-85.0

Powdered Caustic Cleaner

	% by wt.
Miranol J2M Conc. or Miranol J2M-SF Conc.	1.0- 2.0
Sodium Gluconate	6.0- 6.0
Sodium Hydroxide	93.0-92.0

Industrial Cleaner

	% by wt.
Mirawet FL	10.0
Potassium Hydroxide, 45%	10.0
Versene 100	5.0
Kasil #1	25.0
Water	50.0

SOURCE: Miranol, Inc.: Formulas

Chlorinated All Purpose Cleaner Sanitizer for Food Processing Plants

Ingredients:	% by Wt.
Sodium carbonate, light density	15.0
Sodium tripolyphosphate, anhydrous	25.0
Sodium metasilicate, pentahydrate	25.0
Chlorinated TSP	30.0
Makon 10	1.0
Bio-Terge PAS-8S	4.0

Mixing Procedure:
Absorb Makon 10 and Bio-Terge PAS-8S onto carbonate and sodium tripolyphosphate. Preweigh rest of materials and add while mixing. Finally add chlorinated TSP and mix until homogeneous.

Properties:
Appearance: White, free-flowing powder
Odor: Slightly chlorine
pH, 1% aqueous: 11.5

Use Instructions:
For general clean-up operations manually by high pressure cleaning, or by foam cleaning. Use 1/2 to 3 oz/gal, depending upon mode of application and soil load.

Performance:
Leaves utensils, equipment, and other washable surfaces clean, bright, and sanitized.

Comment:
Bio-Terge PAS-8S is an excellent choice for a chlorine-stable surfactant in above formulation. USDA registration required.

Source: Stepan Co.: Formulation No. 263

Medium Duty Liquid Steam Cleaner

Grade 40 silicate of soda	38 lbs
45% potassium hydroxide	32 lbs
60% potassium pyrophosphate	29 lbs
Monawet SNO-35	1 lb

Use level - 1 ounce per gallon of water

SOURCE: Mona Industries, Inc.: MONAWET SNO-35: Formula

Chlorinated All Purpose Cleaner Sanitizer for Food Processing Plants

Ingredients:	% by Wt.
Sodium carbonate, light density	56.0
Na3NTA or Na4EDTA	3.0
Chlorinated TSP	30.0
Makon 10	1.0
Bio-Terge PAS-8S	10.0

Mixing Procedure:
Absorb Makon 10 and Bio-Terge PAS-8S onto carbonate and NTA or EDTA. Preweigh rest of materials and add while mixing. Add chlorinated TSP last and mix until homogeneous.

Properties:
Appearance: White, free-flowing powder
Odor: Slightly chlorine
pH, 1% aqueous: 11.0

Use Instructions:
For general clean-up operations by manual cleaning, high pressure cleaning, or foam cleaning. Use 1/2 to 3 oz/gal, depending upon mode of application and soil load.

Performance:
Leaves utensils, equipment, and other washable surfaces clean, bright, and sanitized.

Comment:
USDA registration required.
Formulation No. 264

Power Foam (Foam Cleaner for Food Processing Plants)

Ingredients:	% by Wt.
Bio-Soft LD-95	50.0
Ammonyx LO	5.0
Sodium metasilicate	2.0
Trisodium phosphate	2.0
Tetrasodium EDTA	1.5
Butyl carbitol	3.0
Water, D.I.	36.5

Mixing Procedure:
Dissolve builders in water, add remaining ingredients while under agitation. Mix until clear.

Properties:
Appearance: Clear liquid
pH, as is: 12.5
Viscosity @ 25C, cps: 100

Use Instructions:
Use with a heavy duty foam gun.
Follow foam gun manufacturer's directions.

Performance:
Provides a high, stable foam.
Formulation No. 270

SOURCE: Stepan Co.: Formulations

Chlorinated All Purpose Cleaner Sanitizer for Food Processing Plants

Ingredients:	% by Wt.
Sodium carbonate, light density	25.0
Sodium tripolyphosphate, anhydrous	30.0
Sodium chloride	25.0
Sodium metasilicate, pentahydrate	5.0
CDB Clearon	4.0
Makon 10	1.0
Bio-Terge PAS-8S	10.0

Mixing Procedure:
Absorb Makon 10 and Bio-Terge PAS-8S onto carbonate and sodium tripolyphosphate. Preweigh remaining materials and add while mixing. Add CDB Clearon last and mix until homogeneous.

Properties:
Appearance: White, free-flowing powder
Odor: Slightly chlorine
pH, 1% aqueous: 10.5

Use Instructions:
For general clean-up operations by manual, high pressure, or foam cleaning. Use 1/2 to 3 oz/gal, depending upon mode of application and soil load.

Performance:
Leaves utensils, equipment, and other washable surfaces clean, bright, and sanitized.

Comment:
USDA Registration required.

SOURCE: Stepan Co.: Formulation No. 265

Concentrated Liquid Steam Cleaner

	Parts by Weight
Monateric CyNa-50	15.0%
Sodium Metasilicate-5H2O	20.0%
Potassium Hydroxide (45%)	22.0%
Water	43.0%

SOURCE: Mona Industries, Inc.: MONATERIC CyNa-50: Formula

CIP Cleaner (Powder)

Soil: Oil, fat, protein
Surface: Stainless steel
Application Method: Cleaning in place
Manufacture: Ribbon or paddle blender

Composition A:	% Wt
STPP	40.0
Sodium Carbonate	12.0
*C12-C13 Linear Alcohol, 3 Moles EO	3.0
Metso Beads 2048	25.0
Sodium Hydroxide Beads	20.0

Composition B:	% Wt
STPP	40.0
Sodium Carbonate	12.0
*C12-C13 Linear Alcohol, 3 Moles EO	3.0
Metso Pentabead 20	45.0

Use Dilution: 1.5-3.0% bw (2-4 oz/gallon)
* BASF (Linear Alcohol Alkoxylate, HLB 7, Low Foam)

Milk Can Cleaner (Powder)

Soil: Fat and Protein
Surface: Metal
Application Method: Wipe or brush
Manufacture: Ribbon or paddle blender

Composition:	% Wt
STPP	30.0
Metso Beads 2048	30.0
Sodium Carbonate	35.0
*Sodium Dichloroisocyanurate, 2H2O	3.0
**Sodium Alkylaryl Sulfonate Powder, (90%)	2.0

Use Dilution: 0.75-1.5% bw (1-2 oz/gallon)
* Olin Chemical
** Stepan, Witco

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Cleaner Built-#1

Ingredient:	Weight, %
Water	68%
Na3NTA	1%
Na Gluconate	1%
45% KOH	10%
42 Silicate N	10%
Glycol Ether	5%
Nonionic surfactant	2%
Amphoteric	3%

Both the Amphoteric SC and the competitive imidazoline amphoteric coupled the formulation together with 3% of the amphoteric.

Cleaner Built-#2

Ingredient:	Weight, %
Water	79%
Na Metasilicate pentahydrate	1%
STPP	10%
Nonionic surfactant	5%
Amphoteric	5%

Both the Amphoteric SC and the competitive imidazoline coupled the formulation together with 5% of the amphoteric.

SOURCE: Exxon Chemical Co.: AMPHOTERIC SC: Formulas

Lightly Built D-Limonene Cleaner

Component:	Weight %
D-limonene	20.0
E-14-5	4.5
E-14-2	1.0
Ninol 11CM	4.5
Nonionic Surfactant (HLB 13)	1.0
Water	60.0
Silicate and/or phosphate	1.5
EDTA	0.5
Alkali Surfactant	0.5-3.0
Water (softened)	to make 100%

Exxon E-14-5, E-14-2 and Ninol 11CM are the primary emulsifiers for D-limonene. They work synergistically. Blend the first five components and then slowly add the water. The emulsion may get quite viscous but will thin as more water is added. Upon addition of the inorganics, the system will cloud. Add Exxon Alkali Surfactant to couple system to clarity. Check for 120F stability. If the emulsion clouds at 120F and does not clear upon cooling, add a little more Alkali Surfactant to gain 120F stability.

SOURCE: Exxon Chemical Co.: D-Limonene Based Cleaner Formulations

Concrete Cleaners (Powder)

Soil: Petroleum and grease
Surface: Concrete
Application Method: Spray or brush
Manufacture: Ribbon or paddle blender

Composition A:	% Wt
STPP	10.0
Sodium Carbonate	26.0
*Nonylphenoxy Polyethoxyethanol, 9-10 Moles EO	6.0
Pine Oil	3.0
Metso Pentabead 20	55.0

Composition B:	% Wt
TSP	20.0
Sodium Carbonate	25.0
Pine Oil	2.0
Metso Beads 2048	30.0
**Sodium Alkylaryl Sulfonate Powder (90%)	9.0
Sodium Hydroxide Beads	14.0

Use Dilution: 1.5-3.0% bw (2-4 oz/gallon)
* Rohm & Haas, GAF, Union Carbide
** Stepan, Witco

Printing Plant Cleaner

Soil: Ink pigment and oil
Surface: Metal
Application Method: Wipe or brush
Manufacture: None

Composition:	% Wt
Metso Pentabead 20	100.0

Use Dilution: 3-4.5% bw (4-6 oz/gallon)

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Creme Cleanser

Ingredients:	Percent by Weight
1) Kerosene	5
2) VM&P naphtha	20
3) Oleic acid	9
4) Triethanolamine	3
5) Propylene glycol	3
6) Tergitol NP-10	4
7) Water	40
8) Sodium Hexametaphosphate	1
9) Kaopolite SF or 1168	10
10)Korthix H	5

Procedure:

Combine (1) through (4), with vigorous agitation, continuing until well dispersed. In another vessel, disperse (5), (6), (7) and (8), and disperse (9) and (10) in the mixture with maximum agitation. Reduce agitation in the oil mixture to moderate, add the water mixture slowly, and stir until well blended.

Comment:

1-Adjust (10) to give consistency desired.

2-Use of Kaopolite 1168 for more aggressive cleaning and polishing action.

Creamy Scouring Cleanser

Ingredients:	Percent by Weight
Water	55.9
1) Korthix H	4.0
2) Kaopolite 1168	30.0
3) Surfanol 430	4.5
4) Surfanol 630	4.5
5) Surfamide (WC-Con)	1.0
Preservative	0.1
Dye & Perfume	q.s.

Procedure:

Blend Korthix H with water under high shear agitation. Add Kaopolite 1168 slowly until smooth. Blend remaining ingredients (3, 4, 5) until smooth.

SOURCE: Kaopolite, Inc.: Suggested Formulations

Creme Cleanser

Ingredients:	Percent by Weight
1) Kerosene	5.0
2) VM & P naphtha	20.0
3) Oleic acid	9.0
4) Triethanolamine	3.0
5) Kaopolite SF-O	10.0
6) Water	40.0
7) Propylene glycol	4.0
8) Tergitol NPX	4.0
9) Korthix H	5.0

Procedure:

Combine (1) through (4), then add (5) slowly with vigorous agitation, continuing until well dispersed. In another vessel, combine (6), (7) and (8), and disperse (9) in the mixture with good agitation. Reduce agitation in the oil mixture to moderate, add the water mixture slowly, and stir until well blended.

Liquid Sandpaper (Water Base)

Ingredients:	Weight %
1) 100 Mesh Grit	50
2) Koraid	3
3) Korthix	3
4) Water	44

Procedure:

Add (2&3) to water with fast mixing. Slow mixer and add 100 Mesh Grit. Some settling will occur, but is easily redispersed by shaking container.

Modifications:

1) For more viscosity and even less settling, increase (2&3), Koraid PSM and Korthix, to 5%.

2) Various types and sizes of grits (1) can be used to achieve different sanding properties.

SOURCE: Kaopolite, Inc.: Suggested Formulations

Bottle Washing Compound

Ingredients:	% wt/wt
Amphoterge J-2 (40% sol'n)	1.5
Sodium gluconate	2.5
Sodium hydroxide (50% sol'n)	25.0
Water	71.0

Preparative Procedure:

Charge the mixing vessel with all the water. Add the sodium gluconate and sodium hydroxide and mix until clear. When the solution is clear, mix in the Amphoterge J-2 until a clear solution is obtained.

SOURCE: Lonza, Inc.: Formula D-51-20

Dry Cleaner Formula

Mineral Oil	25%
Butyl Cellosolve	25
Calimulse PRS	50
Optical Brightener	Q.S.
Antistat	Q.S.

Use level 1 1/4 oz/gallon chlorinated solvent. Add 1% water to final mix.
Pilot Formula #163

Dry Cleaner Pre-Spot

Calimulse PRS	11.0%
Calamide C	2.2
Nonionic	11.0
Water	75.8
Citric Acid	Q.S. to pH 6.5-7.0
Perfume & Color	Q.S.

Use: Dilute 8:1 with water prior to use.
Pilot Formula #211

Ink and Rubber Roll Cleaner

Calimulse PRS	4.25%
High Flash Stoddard	85.00
Ethoxylated Nonyl Phenol	4.25
Water	6.50

Pilot Formula #188

SOURCE: Pilot Chemical Co.: CALIMULSE: Formulas

Formulation Effective for Removing Oil from Hard Surfaces

Water	88
Tomah Q-17-2	1
Tomah AO-14-2	1
Texstim 8741	2
Sodium Metasilicate Pentahydrate	5
EDTA	2
45% Caustic Potash	1

This formulation was used successfully to clean oily soil at 5:1, 10:1, and 20:1 dilutions. Oil separation occurred upon adjusting the pH to 8.

SOURCE: Exxon Chemical Co.: Tekstim 8741: Formula

Dry Powdered Detergents

The following test composition indicated Monateric LF-100's outstanding stability on caustic soda. This formula has been stored for weeks at 95C and for several months at 50C with little or no change in color or flowability. Detergency and foaming properties were also unaffected.

Highly Alkaline Cleaner

Caustic Soda	90%
Soda Ash	5%
Monateric LF-100	5%

Low Foaming, Heavy Duty, Spray Tank Cleaner Phosphate Containing Formula

STPP	24%
"Metso" Anhydrous	24%
Soda Ash	24%
Caustic Soda	24%
Monateric LF-100	4%

Non-Phosphate Formula

"Metso" Anhydrous	32%
Soda Ash	32%
Caustic Soda	32%
Monateric LF-100	4%

These formulas, when used in spray tanks at only 1 oz/gal, were found to be as good detergents as the commonly used low foaming nonionic based detergents which are dependent on the operating temperature for satisfactory cleaning and low foaming properties.

SOURCE: Mona Industries, Inc.: MONATERIC LF-100 & LFNa-50: Formulas

Liquid Cleaner for High Pressure Application

	Parts by Weight
Water	44.0%
Monateric CyNa-50	20.0%
Sodium Carbonate (Anhydrous)	22.0%
Sodium Metasilicate-5H2O	10.0%
Sodium Benzoate	1.0%
Sodium Xylene Sulfonate	1.0%
Diethylene glycol monoethyl ether	2.0%

SOURCE: Mona Industries, Inc.: MONATERIC CyNa-50: Formulas

Dust Control Foamer

Ingredients:	Composition
Stepantan DS-40	100%

Usage Level:
Use Stepantan DS-40 at 0.3-0.5% concentration
Physical Properties:
Appearance: Clear yellow liquid
pH, 10% aqueous: 7.5
Density, lbs/gal: 8.7
Viscosity, @ 25C: Viscous liquid, but still pumpable
Comments:
May be used alone or with Stepanate SXS and water
Formulation No. 325

Pet Conditioner

Ingredients:	Wt. %
Ammonyx 485	3.0
Kessco Glycerol Monostearate	1.0
Kessco Cetyl Alcohol	2.0
Stearyl Alcohol	2.0
Glycerine	1.25
FD&C #5 (1% aqueous soln.)	0.064
Preservative, Fragrance	Q.S.
Deionized Water	Q.S. to 100%

Mixing Instructions:
Combine ingredients in a mixing vessel. Mix and heat to 70C. Let stir until cooled to room temperature. Add fragrance, dye and preservative.
Physical Properties:
Yellow, opaque cream
pH (as is): 4.5-5.0
Stable at 50C for one month
Passes three freeze thaw cycles
Formulation No. 55

SOURCE: Stepan Co.: Formulations

Floor Cleaner and Wax Stripper

Raw Materials:	% by Weight
Surfonic N-95	1
Monoethanolamine	1-2
Alkaline builders	As desired
Water, dye, fragrance	As desired*

Floor Cleaner and Wax Stripper

Raw Materials:	% by Weight
Surfonic N-85	8
Tetrapotassium** pyrophosphate	2
Trisodium phosphate	1
Water, dye	As desired*

* These products should be diluted with water 20 to 1 when used as a wax stripper and 80 to 1 when used for general cleaning.

** Or tetrasodium

The detergency and wetting properties of Surfonic N-95 are utilized in industrial floor cleaners and wax strippers. Inclusion of monoethanolamine provides wax stripping capability.

Wax Stripper and Cleaner

Raw Materials:	Parts by Weight
Surfonic N-120	10
Surfonic N-40	2
Tetrapotassium pyrophosphate*	2
Trisodium phosphate	1
Water	85

* Tetrasodium pyrophosphate may be substituted for tetrapotassium pyrophosphate.

If a slight haze is apparent in this formulation, the product may be cleared by the addition of small quantities of alcohol or by the addition of dyes which are usually used in the commercial products. This product should be diluted 20 to 1 with water when used as a floor wax stripper. It is diluted 80 to 1 with water when used for general cleaning.

SOURCE: Texaco Chemical Co.: Formulas

Foam Marker Concentrates, High Quality

High Viscosity

	%w
Neodol 25-3S (60%)	17.5
Alcohol sulfate (30%) (a)	31.5
Cocoamidopropyl betaine (30%) (b)	20.0
FADEA (c)	4.0
Isopropyl alcohol	5.0
Water	22.0

Properties:

Viscosity, 73F, cps: 418
Phase coalescence temp., F: >176
pH: 9.7
Foam Ht (d), mm: 93

Low Viscosity

	%w
Neodol 25-3S (60%)	33.5
Cocoamidopropyl betaine (30%) (b)	15.0
FADEA (c)	4.0
Isopropyl alcohol	5.0
Water	42.5

Properties:

Viscosity, 73F, cps: 55
Phase coalescence temp., F: >176
pH: 9.7
Foam Ht (d), mm: 125

Use Concentration:

1-2 oz./gal.

Blending Procedure:

Add Neodol 25-3S last, slowly with good stirring.

(a) Witcolate A, Witco Corp., or equivalent product.
(b) Lexaine C, Inolex Chemical Co., or equivalent product.
(c) Fatty acid diethanolamide, Ninol 49 CE, Stepan Co., or equivalent product.
(d) Spray foam test, surfactant concentration=0.1%w. Foam height measured at 0 and 40 min. See C.L. Merrill, "Optimization of Foaming/Defoaming Criteria for Surfactants", Shell Chemical Co. Customer Report, January, 1985, for details of this test.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formula

Gentle Abrasive Lotion Cleanser for Bathroom and Kitchen

Ingredients:	Percent by Weight
1) Water	60.8
2) Korthix H	0.2
3) Sodium Carbonate, anhydrous	1.0
4) Tetrasodium pyrophosphate, anhydrous	1.0
5) Sodium metasilicate, pentahydrate	1.0
6) Kaopolite SF or 1168	24.0
7) CMC-7M8S (5% solution in water)	10.0
8) Synorol LM-60	2.0

Procedure:

Disperse ingredients (2) through (7) in that sequence, into the water, with vigorous agitation, allowing time for each to dissolve or disperse thoroughly. Reduce agitation to avoid excessive foaming, slowly add (8).

Comment:

1-If a more viscous product is wanted, increase (2) and (7), keeping same ratio. These can be adjusted to give the desired viscosity characteristics.
2-Use of Kaopolite 1168 gives more aggressive cleaning and polishing action to the formulation.

Polishing Cleaner for Plastic Windows

Ingredients:	Percent by Weight
1) Deionized water	63.5
2) Tetrasodium pyrophosphate	4.0
3) Potassium tripolyphosphate	2.5
4) Kaopolite SF or 1168	12.5
5) Stepanate X	5.0
6) Synotol LM-60	12.5

Procedure:

Dissolve (2) and (3) in (1). Add (4) slowly with vigorous agitation, continuing until well-dispersed and smooth. Reduce agitation to avoid foaming, stir in (5) and (6).

Comment:

Use Kaopolite 1168 for more aggressive cleaning and polishing action.

SOURCE: Kaopolite, Inc.: Suggested Formulations

Grease Cutting Pressure Wash

Water	86.5 Wt.%
Sodium Metasilicate Anhydrous	2.5
Tetrasodium Pyrophosphate	1.0
50% NaOH	4.5
Versene 100	1.5
Tomah AO-14-2	1.0
Tomah Q-14-2	2.0
Nonionic Surfactant	2.0

pH: 12.5
SpG: 1.035 @ 74F.
Wt./Gal.: 8.62 @ 74F.

Industrial Degreasing Steam Cleaner

Water	81.5 Wt.%
Sodium Metasilicate Anhydrous	2.0
50% NaOH	9.5
Trisodium NTA	1.0
Tomah AO-14-2	1.5
Tomah Q-14-2	1.5
Nonionic Surfactant	3.0

pH: 13.0
SpG: 1.060 @ 74F.
Wt./Gal.: 8.83 @ 74F.

Light Duty Neutral Cleaner

Water	95.0 Wt.%
Tomah AO-14-2	1.0
Tomah Q-14-2	1.0
Nonionic Surfactant	3.0

pH: 7.6
SpG: 1.002 @ 74F.
Wt./Gal.: 8.35 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Household and Janitorial Cleaning Formulations

Low Foaming Industrial Cleaner-A

Component:	% by Weight
Water	73
Burcosolv TM	5
Burco TME	7
Burco LAF-125	15

Low Foaming Industrial Cleaner-B

Component:	% by Weight
Water	68
Burcosol ADS-40	5
Burcosolv TM	5
Burco TME	7
Burco LAF-125	15

Low Foaming Industrial Cleaner-C

Component:	% by Weight
Water	68
Burcosolv TM	5
Burco TME	3
Burco FAE	4
Burco LAF-125	20

Low Foaming Industrial Cleaner-D

Component:	% by Weight
Water	63
Burcosol ADS-40	5
Burcosolv TM	5
Burco TME	3
Burco FAE	4
Burco LAF-125	20

Formulations A and B are oil splitters while C and D are emulsifiers if a high enough concentration is used. Normally 10% dilutions of formulations C and D will give good oil emulsification. The emulsification can be eliminated by acidifying to pH's of 4 or below. The Burcosolv ADS-40 in Formulations B and D adds hard water compatibility and antiredeposition properties.

Other builder additives (phosphates, silicates) can be added in moderate quantities. Formulation compatibility must be evaluated. If necessary, sodium xylene sulfonates can be used as a hydrotrope. Sodium metasilicates have shown particularly good additive response when used with Burco TME.

These low foaming formulations may be used for metal cleaners, hard surface cleaners and other spray applications or high speed processes where low foaming is required.

SOURCE: Burlington Chemical Co., Inc.: Formulas

Hand Cleaners

Pilot concentrates may be used to make dry hand cleaners for lavatory dispensers and waterless cream hand cleaners. A quality liquid filler for dispensers is a 5% solution of Calsuds concentrates diluted with equal parts of water and isopropyl alcohol.

Waterless

A.:	
White Oil (heavy)	30.0%
Deodorized Kerosene	10.0
Ethylene Glycol Monostearate	10.0
Calimulse	5.0
B.	
Propylene Glycol	5.0
Ethoxylated Lanolin, USP	6.0
Water	34.0
Perfume	0.1

Heat A and B separately to 70C.
Add B to A with stirring.
Add perfume below 40C.
Product will thicken on standing.

Pilot Formula #107-A

Liquid

A.	
Deodorized Mineral Spirits	53.0%
Calsuds CD-6	9.5
White Oil	5.0
B.	
Water	32.0
p-Chloro-meta-xyenol	0.5

Heat A and B separately to 65-70C.
Add B to A with stirring.

Pilot Formula #169

SOURCE: Pilot Chemical Co.: Industrial and Commercial Products: Hand Cleaners

Liquid Hand Soap

	% by Wt.
Miranol SM Conc.	20.0
Coconut Potassium Soap, 40%	20.0
Water	60.0

Note: This formula may be further diluted to meet cost requirements. Even the addition of another 100 parts of water produces an exceptional hand soap. One percent sodium chloride may be added to increase viscosity. Unlike a straight soap, the above formulation will not clog dispenser valves if no sodium chloride is added. It is important that a potassium soap be used because triethanolamine soaps foam considerably less in such combinations.

Liquid Hand Soap

	% by Wt.
Mirataine CB	10.0
Cedepon LS 30PM	30.0
Cedemide CX	2.0
Water	58.0
Adjust pH to 7.5	

Liquid Soap

	% by Wt.
Mirataine COB	10.0
Miranol BT	10.0
Miranate LEC	1.0
Cedepon LS 30PM	20.0
Cerasynt IP	1.0
Sodium Chloride	1.0
Water	57.0

Procedure:
Add all ingredients together. Heat and mix until uniform. Allow to cool to 40C and adjust the pH to 7.0 with citric acid.

SOURCE: Miranol, Inc.: Formulas

Liquid Soap

Formulation:	Wt. %
Potassium hydroxide	5.0
Water	50.0
Oleic acid	20.0
Glycerin	20.0
Dowanol DPM glycol ether	5.0

SOURCE: Dow Chemical Co.: Bathroom Products Formula No. 22

Micro Emulsion Cleaner I

Components:	
D-Limonene	40.00
Ninol 11CM	9.00
E-14-5	9.00
E-14-2	2.00
Nonionic Surfactant (HLB 13)	2.00
Water (softened)	to make 100%

Micro Emulsion Cleaner II

Components:	
D-limonene	20.00
Ninol 11CM	4.50
E-14-5	4.50
E-14-2	1.00
Nonionic Surfactant (HLB 13)	1.00
Water (softened)	to make 100%

Micro Emulsion Cleaner III

Components:	
D-limonene	10.00
Ninol 11CM	2.25
E-14-5	2.25
E-14-2	0.50
Nonionic Surfactant (HLB 13)	0.50
Water (softened)	to make 100%

Note: Not all of the above formulations have been checked for 120F stability or freeze/thaw characteristics. The addition of 300-400 ppm NaCl or the use of softened water should make the dilutions of the concentrates more stable/clear.

Non-Butyl/D-limonene Cleaner

Component:	Weight%
D-limonene	7.0
Q-17-2	2.0
AO-14-2	2.0
Nonionic Surfactant (HLB 13)	3.0
E-14-5	3.0
NTA	5.0
Amphoteric L or Alkali Surfactant	1.0
Water	to make 100%

SOURCE: Exxon Chemical Co.: D-limonene Based Cleaner Formulations: Formulas

Non-Abrasive Cleanser

Ingredients:	% wt/wt
Calcium Carbonate, 100 mesh	40.0
Kelzan (1.0% sol'n)	25.0
Veegum HS	2.5
Alkawet CF	2.0
Barlox 12	2.0
Water	28.5

pH: 8.5-9.0
Viscosity: 4000-4500 cps

Preparative Procedure:

Prepare in advance a 1.0% solution of "Kelzan" Xanthan Gum with a suitable level of Dantogard preservative.

Sift the Veegum HS into the water and stir vigorously until thoroughly hydrated (mild heating will facilitate the hydration of Veegum HS). Lower stirring speed to avoid air entrapment and slowly add the Calcium Carbonate. When a smooth paste is obtained, add the Alkawet CF, Barlox 12 and Kelzan solution. Air entrapment must be avoided at this stage. Continue stirring to a smooth, uniform blend.

Formulation R-78-25

Liquid Drain Cleaner

Ingredients:	% wt/wt
Sodium Hypochlorite (5.25% active sol'n)*	90.50
Sodium Chloride	5.00
Sodium Hydroxide (50% active sol'n.)	4.00
Barlox 12	0.50

Preparative Procedure:

Blend sodium hydroxide and sodium hydroxide solutions together. While stirring add sodium chloride. When sodium chloride has completely dissolved, add Barlox 12 and continue stirring until product is uniform.

*Sodium hypochlorite commercially available as a 12.5% aqueous solution may be substituted for the 5.25% material at an appropriate level.

Formula T-59-2

SOURCE: Lonza, Inc.: Formulations

Powdered Concrete Cleaner

Ingredient:	Wt. %
Triton QS-44 Surfactant (1)	7.00
Sodium Orthosilicate	20.00
Caustic Soda	10.00
Trisodium Phosphate, Crystalline (2)	20.00
Sodium Carbonate	14.80
Sodium Metasilicate, anhydrous	15.00
Sodium Tripolyphosphate (3)	5.00
Bentonite Clay or Fullers Earth	8.00
Pine Oil	0.20

(1) Union Carbide Co.
(2) Monsanto Co. TSP-C Code 105
(3) Monsanto Co. STP Code 101

Powdered Concrete Cleaner with Bleach

Ingredient:	Wt. %
Sodium Metasilicate, anhydrous	35.00
Tetrasodium Pyrophosphate (1)	20.00
Sodium Tripolyphosphate (2)	5.00
Bentonite Clay	8.00
Sodium Percarbonate	15.00
Triton QS-44 (3)	7.00
Sodium Sulfate	10.00

(1) Monsanto Co. TSPP Code 101
(2) Monsanto Co. STP Code 101
(3) Union Carbide Co.

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formulas

Heavy-Duty Paint Stripper

	% by wt.
Mirawet ASC	3.0
Potassium Hydroxide (45%)	30.0
Sodium Gluconate	4.0
Water	63.0

SOURCE: Miranol, Inc.: Formula

Paint Stripper

Ingredients:	Wt Percent
Triton QS-44	1.5
Sodium Hydroxide	15.0
Water	83.5

SOURCE: Union Carbide Chemicals and Plastics Co., Inc.: Formula

Steam Cleaning Compound-I

	% by wt.
Miranol C2M-SF Conc.	15.0-15.0
Sodium Metasilicate Pentahydrate	50.0-20.0
Water	35.0-65.0

Steam Cleaning Compound-II

	% by wt.
Miranol C2M-SF Conc.	15.0-15.0
Sodium Metasilicate Pentahydrate	30.0-20.0
Potassium Hydroxide, 45%	11.0-11.0
Water	44.0-54.0

Steam Cleaning Compound-III

	% by wt.
Miranol C2M-SF Conc.	15.0
Sodium Metasilicate Pentahydrate	20.0
Potassium Hydroxide, 45%	22.0
Water	43.0

Procedure:
Dissolve the sodium metasilicate in the water at 70C. Cool to 40C and add the Miranol C2M-SF Conc. The liquid potassium hydroxide may then be added at any time before use.

Steam Cleaning Compound

	% by wt.
Miranol C2M-SF Conc.	15.0
Starso	62.0
Potassium Hydroxide, 45%	10.0
Water	13.0

Heavy Duty Steam Cleaner

	% by wt.
Miranol J2M Conc.	1.0
Potassium Hydroxide, 45%	55.0
Kasil #1	32.0
Gluconic Acid, 50%	4.0
Phosphoric Acid, 75%	8.0

Mix in the order listed.

Precaution:
Phosporic acid must be added very slowly with constant stirring to avoid spattering. The solution is clear and slightly yellow.

SOURCE: Miranol Inc.: MIRANOL Products: Formulas

Waterless Hand Cleaner

Ingredients:	% by Wt.
Water	44.0
Emulsifier WHC	12.5
Deodorized mineral spirits	43.5

Mixing Procedure:
Combine and mix the Emulsifier WHC and water. Heat to 70C with agitation, slowly add mineral spirits to the batch. Continue mixing the formulation to an opaque paste.

Properties:
Appearance: Opaque, cream-colored paste
pH, as is: 8.4
Viscosity @ 25C, cps: 22,300
Actives, %: 12.5

Use Instructions:
Use as is

SOURCE: Stepan Co.: Formulation No. 47

"Waterless" Hand Cleaner Gel (a)

	%w
A. Oil Phase:	
Shell Sol 71 or 72 (b)	35.0
Oleic acid	7.5
Neodol 25-3	4.3
Lanolin (if desired)	0.5
Water Phase:	
Water	47.7
Triethanolamine	3.4
Glycerin	2.1
Perfume, color	as desired

Blending Procedure:
Heat both oil and water phases separately to 140F. The product gel is formed by slowly pouring the oil phase into the water phase, with constant stirring, until a homogeneous, smooth gel is formed. Pour into jars. Let cool at room temperature.

Stability:
Stable at 122F for seven days and after five freeze-thaw cycles (-15F to 73F) of 24 hours each.

(a) This formulation washes off hands readily with water.
(b) Isoparaffinic solvent, b.p. 356-401F, Shell Chemical

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formula

Waterless Hand Cleaners

A. White Oil (heavy)	30.0
Deodorized Kerosene	10.0
Ethylene Glycol Monostearate	5.0
Calimulse	5.0
B. Propylene Glycol	5.0
Deodorized Lanolin	6.0
Water	39.0
Perfume	0.1

Heat A and B separately to 65-70C.
Add B to A with stirring.
Pilot Formula #107

Liquid Hand Cleaner

A. Deodorized Mineral Spirits	42.1
Calsuds CD-6	13.6
White Oil	3.3
B. Water	40.0
p-Chloro-meta-xylenol	0.5

Heat A and B separately to 65-70C.
Add B to A with stirring.
Pilot Formula #164

SOURCE: Pilot Chemical Co.: PILOT Concentrates for Use In Formulating: Formulas

Waterless Hand Cleaner

Surfonic N-95 is used as an emulsifier and a detergent in waterless hand cleaner formulations. A suggested formulation follows:

Component:	Weight %
Part A:	
Mineral oil or spirits	39.0
Oleic acid	9.0
Part B:	
Surfonic N-95	5.0
Propylene glycol	4.5
Triethanolamine	2.5
Monoethanolamine	1.0
Water	39.0

Mix A and B separately, then add B to A with constant stirring. Lanolin may be added in very small amounts for hand smoothening effect.

SOURCE: Texaco Chemical Co.: SURFONIC N-Series Surface-Active Agents: Formulas

Section II

Transportation Cleaners and Polishes

14. Auto Cleaners and Polishes

Cream Car Wax

Ingredients:	% by Weight
1) Silicone Fluid	4.0
2) Silicone (AFL 40)	2.0
3) Carnauba Wax	6.0
4) Mineral Spirits	29.0
5) Oleic Acid	2.0
6) Water	46.0
7) Morpholine	2.0
8) Kaopolite-1152	9.0

Procedure:
A) Combine (1), (3) and (5) into half of the mineral spirits (4).
B) Heat with agitation to 90C until wax melts and a clear solution results.
C) Add (7) morpholine to neutralize wax and add (2) Silicone and remainder of mineral spirits (4) while agitating at 90C.
D) Slurry Kaopolite-1152 into the water with high agitation.
E) Add hot solvent solution (C) to the Slurry (D) and remove heat while continuing to mix until paste polish reaches 55C.
F) Pour into containers.

Sources:
1) Silicone Fluid-L45-Union Carbide Corp.
2) Silicone AFL-40-Union Carbide Corp.
3) Carnauba Wax Ross #3-Frank B. Ross Co.
4) Mineral Spitits "Isopar" K-Exxon Corp.
5) Morpholine-BASF Corp.
6) Kaopolite-1152-Kaopolite, Inc.

SOURCE: Kaopolite, Inc.: Suggested Formulation

Detergent Resistant, Cleaner-Polish for Automobile Painted Surfaces

Part:	Ingredients:	Percent by Weight
A	Water	60.00
	Kaopolite SF	10.00
B	Witcamide 511	1.00
	L-140 Solvent	19.25
C	Dow Corning 531 Fluid	6.00
	Dow Corning 536 Fluid	1.00
D	Dow Corning Z-6108 Resin	0.50
	Anhydrous Ethyl Alcohol	1.50
E	Bentone 38	0.50
F	Anhydrous Isopropyl Alcohol	0.25

Preparation:
1. Load water and Kaopolite SF, with agitation, into mixing vessel.
2. Load Part B.
3. When mixture is uniform, load Dow Corning 531 and 536 Fluids.
4. Premix Part D until resin is soluble in Ethanol. Add this premix to the formulation.
5. Mix until a creamy mixture is obtained. Load Bentone 38 by sifting or screening if low shear equipment is used.
6. When the above mixture is blended, load isopropyl alcohol.
7. Mix until uniform. Package.
   Formulation E2-7360

Silicone Car Paste Polish

Formulation XCP-4489 is a solvent based paste that contains silicone in combination with a hard wax that together provide outstanding gloss and freedom from smear. This formulation is not as durable as Formulation E2-3274 after multiple detergent washings.

Ingredients:	Percent by Weight
200 Silicone Fluid by Dow Corning, 350 cs.	8.0
Carnauba Wax (#1 yellow)	10.0
Petrolite P-25 Wax	10.0
Turpentine	18.0
Naphthol Mineral Spirits	54.0

Preparation:
1. Heat waxes and 200 Silicone Fluid by Dow Corning to melt waxes (210-220F or 99-104C).*
2. Preheat solvent to 165F (74C) and add to wax. (Caution: Flammable).
3. Cool with slow stirring to 140F (60C) and package.
   * If this temperature is inconvenient to reach, melt powdered wax in about 1/4 of the solvent (plus the silicone) at about 195F (91C).

SOURCE: Dow Corning Corp.: Formulation XCP-4489

Detergent Resistant, Corrosion Resistant, Automobile Cleaner, Polish Formulation

Part:	Ingredients:	Percent by Weight
A	Water	54.00
	Kaopolite SF	10.00
B	Kerosene	10.00
	Stoddard Solvent	16.03
	Witcamide 511	1.00
C	Dow Corning 531 Fluid	6.00
	Dow Corning 536 Fluid	2.00
	Isostearic Acid	0.60
	Bentone 38	0.25
	Isopropyl Alcohol	0.12

Preparation:
1. Load water into mixing vessel. Begin agitation. Load Kaopolite SF.
2. Load Part B in order listed to Part A. Continue agitation.
3. Premix Part C separately for five minutes. Add to Parts A and B.
4. When A, B, and C, have formed a creamy water-in-oil emulsion, load the Bentone 38 by screening or sifting the powder over the mixing fluid. This will avoid lumping or agglomeration of the Bentone 38.
5. Load isopropyl alcohol. Mix until uniform. Package. Formulation E2-7166A

Liquid Silicone Car Polish

Formulation CP-92A is a polish designed to give a lustrous, high gloss, protective film on painted auto surfaces. This suggested formulation is simple and easy to produce and can be used as a starting point for many possible variations. This formulation is not as durable as formulation E2-7207 after multiple detergent washings.

Part:	Ingredients:	Percent by Weight
A	200 Silicone Fluid by Dow Corning, 350 cs.	4.0
	Stoddard Solvent	19.0
	Kerosene	2.0
	Oleic Acid	2.5
B	Morpholine	1.5
	Water	16.0
C	Snow Floss	14.0
	Water	41.0

Preparation:
1. Mix Part A with high-shear mixer (Colloid Mill or Eppenbach mixer).
2. Slowly add Part B to Part A while continuing to mix.
3. Continue to mix while adding Part C to the AB combination.
4. Oleic acid may be added to Part B, if desired, and then mixed as above.

SOURCE: Dow Corning Corp.: Formulation CP-92A

Liquid Car Polish Formulation

Material:	Parts by Weight
Water	57.2
Triethanolamine	0.2
Wax Emulsion*	2.5
Morpholine	2.0
SF96 (350)	1.5
Carbopol 681-X1	0.6
Oleic Acid	2.5
Kerosene	10.0
Mineral Spirits	6.0
Isopropanol	0.4
Mineral Spirits	5.0
SF1706	1.5
SF1705	2.1
Kaopolite SF	8.5

Viscosity: approximately 1,000 cP
pH: 9

Mixing Procedure:
1. Mix water, triethanolamine, wax emulsion and morpholine until homogeneous.
2. Mix Carbopol 681-X1 in SF 96 (350). Add oleic acid, kerosene and mineral spirits. Mix. Add this mixture to the water phase in Step 1.
3. Mix isopropanol, mineral spirits, SF1706 and SF1705 until homogeneous. Add to above. Mix.
4. Slowly add Kaoplite SF to above. Mix until homogeneous.

*Wax Emulsion Formulation

(To be used in the Liquid Car Polish Formulation)

Material:	Parts by Weight
Bareco C-36 Wax	12
Hoechst Wax E	8
Oleic Acid	3
Morpholine	4
Water	73

Mixing Procedure:
1. Melt the waxes at approximately 90C.
2. Add oleic acid. Mix.
3. Add morpholine. Mix.
4. Heat the water to above temperature. Add to the wax mixture. Cool quickly.

SOURCE: The BF Goodrich Co.: CARBOPOL: Formula

Liquid Silicone Polish for New Cars and Metallic Paints

Formulation E2-7390 is a low abrasive (3%) polish designed for new car surfaces with little oxidation or for surfaces with metallic paints. This formulation provides a product with easy rub out and buffability, excellent gloss, and exhibits moderate durability.

Part:	Ingredients:	Percent by Weight
A	Water	67.00
	Kaopolite SF	3.00
B	Witcamide 511	1.00
	Stoddard Solvent	24.25
C	200 Silicone Fluid by Dow Corning, 1,000 cs.	1.50
	200 Silicone Fluid by Dow Corning, 350 cs.	1.50
	Dow Corning 536 Fluid	1.00
D	Bentone 38	0.50
E	Anhydrous Isopropyl Alcohol	0.25

Preparation:

1. Add water and Kaopolite SF, with agitation, into mixing vessel
2. Add Part B while continuing mixing.
3. When mixture is uniform, add Part C.
4. Mix until a creamy mixture is obtained. Add Bentone 38 by sifting or screening if low-shear equipment is used.
5. When the above mixture is blended, add isopropyl alcohol.
6. Mix until uniform. Package.

SOURCE: Dow Corning Corp.: Formulation E2-7390

Silicone Spray Wax

SWS F-36 Silicone Fluid	25.3 Wt.%
Isopropanol (99%)	3.0
Tomah PIB-T	2.0
Water	53.7
Tomah Emulsifier Four	16.0

pH: 6.4
SpG: 0.9809 @ 74F.
Wt./Gal.: 8.17 @ 74F.
(dilute 10:1) (6-8 oz/vehicle)

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formula

15. Car and Truck Wash Compounds

Aluminum Trailer Cleaner and Brightener

Phosphoric Acid, 75% (1)	50%
Nonionic Surfactant (2)	2-5%
Butyl Cellosolve	5-10%
Citric Acid, 50% (3)	6-8%
Water	q.s.

Use concentration, 1-2 oz/gallon [0.75-1.5 l./100 l.]
(1) Monsanto Co.
(2) Triton X-100 and N-101, Union Carbide
(3) Hydroxyacetic acid can be substituted.

Aluminum Truck Cleaner and Brightener

Phosphoric Acid, 85% (1)	3.0%
Citric Acid	4.0%
Dodecylbenzene Sulfonic Acid (2)	3.0%
Butyl Cellosolve	4.0%
Water	86.0%

Application: Wipe on, rinse and wipe off.
(1) Monsanto Co.
(2) Such as Bio-Soft S-100, Stepan Co. or Calsoft LAS-99, Pilot Chem. Co.

SOURCE: Monsanto Co.: Acid Cleaners: Formulas

Truck Wash

Ingredient:	Wt. %
Triton X-100 (1)	15.0
Sodium Tripolyphosphate (2)	35.0
Sodium Carbonate	29.0
Sodium Sesquicarbonate	10.0
Sodium Metasilicate, pentahydrate	10.0
Zeolox 23-1 Silica	1.0

(1) Union Carbide Co.
(2) Monsanto Co. STP Code 101

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formula

Car Wash

Ingredients:	% by Wt.
Water	71.0
Stepanate SXS	5.0
Triethanaolamine	3.0
Sodium EDTA	5.0
Bio-Soft LD-190	16.0

Mixing Procedures:
Mix ingredients in the order shown above.
Properties:
Appearance: Clear, light, yellow liquid
Viscosity @ 25C, cps: 60
pH, as is: 9.8
Density, lbs/gal: 8.74
Use Instructions:
Dilute 1/4 to 1 ounce of product in 2 gallons of water
Formulation No. 34

Car Wash

Ingredients:	% By Wt.
Water, D.I.	53.0
EDTA	2.0
Bio-Soft D-62	30.0
Ninol 1281	15.0

Mixing Procedure:
Charge tank with water. Add ingredients in the order given while mixing.
Properties:
Appearance: Clear, yellow liquid
Viscosity @ 25C, cps: 800
pH, as is: 9.5
Use Instructions:
Dilute 1 to 4 ozs of product in 1 gallon of water.
Formulation No. 84

Car Wash

Ingredients:	% by Wt.
Water, D.I.	67.0
Bio-Terge AS-40	15.0
Ninol 40CO	4.0
Steol CS-460	10.0
Sodium chloride	4.0

Mixing Procedure:
Charge tank with water. Add ingredients in the order given while mixing.
Properties:
Appearance: Clear, yellow liquid
Viscosity @ 25C, cps: 550
pH, as is: 9.5
Use Instructions:
Dilute 1 to 4 ozs in 1 gallon of water
SOURCE: Stepan Co.: Formulation No. 89

Car Wash Detergent (Powder)

Soil: Clay, particulate, oil, grease
Surface: Painted, anodized aluminum
Application Method: Spray/brush/wipe
Manufacture: Ribbon or paddle blender

Composition A:	% Wt
Metso Beads 2048	20.0
STPP	40.0
TSP	5.0
Sodium Carbonate	20.0
*Sodium Alkylaryl Sulfonate Powder (90%)	5.0
**C9-C11 Linear Alcohol, 6 Moles EO	10.0

Composition B	% Wt
Metso Pentabead 20	30.0
STPP	44.0
Sodium Carbonate	10.0
CMC	1.0
*Sodium Alkylaryl Sulfonate Powder (90%)	5.0
***Octylphenoxy Polyethoxyethanol, 7-8 Moles EO	5.0
***Octylphenoxy Polyethoxyethanol, 5 moles EO	5.0

Use Dilution: 1.5% bw (2 oz/gallon)
Dissolve in stock tank and meter into wash system. Composition B can be utilized in high pressure spray carwash systems and supplies good soil removal.

* Stepan, Witco
** Shell, Vista
*** Rohm & Haas, GAF

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Car Wash Concentrate

Ingredients:	% by Wt.
Water	50.7
NaOH (50%)	5.5
Bio-Soft S-100	20.8
Alpha-Step ML-40	23.0

Mixing Procedures:
Charge tank with water and add sodium hydroxide. Add Bio-Soft S-100 while mixing. Adjust pH to about 7 with sodium hydroxide or Bio-Soft S-100 as required. Add Alpha-Step ML-40. Adjust final pH to requirements.

Typical Properties:
Appearance: Clear yellow liquid
Solids, %: 30.0
pH, as is: 7.0
Viscosity @ 25C, cps: 200

Use Instructions:
Dilution Ratio: 600

SOURCE: Stepan Co.: Formulation No. 489

Car Wash Liquids

Neutral, no-residue washes formulated with Pilot Calsoft concentrates are especially compounded to protect high luster finishes while lifting away surface dirt and grime. Calsuds is used both in liquid car washes and in wash-and-wax formulas.

Pilot Calamide as a car wash base acts as a safe foam stabilizer, lubricant and rust and corrosion inhibitor.

Pilot Formula #140:	
Calsuds A	50
Calfoam NEL-60	5
Water	45

Pilot Formula #144:	
Calsoft L-60	30
Pilot SXS-40	7.5
Calfoam NEL-60	3
Calamide O	3
Versene	0.25
Caloxylate N-9	2
Water	54.25

Pilot Formula #180:	
Calsoft T-60	20
Caloxylate N-9	5
Pilot SXS-96	2
Water	73

SOURCE: Pilot Chemical Co.: Pilot Concentrates : Car Care Products: Formulas

Liquid Car Wash

Calsoft T-60 is an efficient, relatively inexpensive base for liquid car wash, providing an appealing foam even in hard water.

Pilot Formula #180:	
Calsoft T-60	20%
Primary Alcohol Ethoxylate	5
Pilot SXS-96	2
Water	73

SOURCE: Pilot Chemical Co.: Calsoft T-60: Formula #180

Car Wash Liquid Concentrates
High Quality

	%w
Neodol 25-3S (60%)	15.0
Neodol 91-6	8.0
C12 LAS (60%) (a)	30.0
FADEA (b)	5.0
Ethanol	3.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 213
- Phase coalescence temp., F: >176
- Clear point, F: 28
- pH: 10.3

Good Quality

	%w
Neodol 25-3S (60%)	13.9
Neodol 91-6	7.0
C12 LAS (60%) (a)	27.0
FADEA (b)	3.0
Ethanol	3.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 235
- Phase coalescence temp., F: >176
- Clear point, F: 28
- pH: 9.2

Economy

	%w
Neodol 25-3S (60%)	8.3
Neodol 91-6	5.0
C12 LAS (60%) (a)	16.7
FADEA (b)	3.0
Ethanol	2.0
Water, dye, perfume	to 100%

Properties:
- Viscosity, 73F, cps: 240
- Phase coalescence temp., F: >176
- Clear point, F: 36
- pH: 9.4

(a) Witconate 1260., Witco Corp., or equivalent product.
(b) Fatty acid diethanolamide, such as Ninol 49 CE, Stepan Co., or equivalent product.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Car Wash Liquid Concentrates (Continued)
Generic

	%w
Neodol 25-3S (60%)	6.7
Neodol 91-6	4.0
C12 LAS (60%) (a)	13.3
FADEA (b)	2.0
Water, dye, perfume	to 100%

Properties:
Viscosity, 73F, cps: 68
Phase coalescence temp., F: >176
Clear point, F: 32
pH: 9.5

Blending Procedure:
Effective stirring should be maintained during addition of all ingredients, and each ingredient should be in solution before the next is added. A blending temperature somewhat above ambient (e.g.,100-120F) is preferred.

1. Dissolve the ethanol (when indicated) and linear alkylbenzene sodium sulfonate (LAS) in water.
2. Add the Neodol 91-6.
3. Add the Neodol 25-3S slowly with efficient stirring.
4. Add the amide with efficient stirring.
5. Add perfume and dye as needed to give desired odor and color.

(a) Witconate 1260, Witco Corp., or equivalent product.
(b) Fatty acid diethanolamide, such as Ninol 49 CE, Stepan Co., or equivalent product.

SOURCE: Shell Chemical Co.: Starting Formulations for Cleaning Products: Formulas

Car Wash Powder Premium Quality

Ingredient:	Wt. %
Neodol 91-6 (1)	10.0
Sodium Tripolyphosphate (2)	80.0
Sodium Metasilicate, anhydrous	10.0

Car Wash Powder, Good Quality

Ingredient:	Wt. %
Neodol 91-6 (1)	5.0
DDBSA (98%) (3)	5.0
Sodium Carbonate	42.0
Sodium Tripolyphosphate (2)	40.0
Sodium Metasilicate, anhydrous	8.0

(1) Shell Chemical Co.
(2) Monsanto Co. STP Code 101
(3) Dodecylbenzene sulfonic acid

Car Wash Powder

Ingredient:	Wt. %
Sodium Tripolyphosphate (1)	85.0
Triton X-114 (2)	15.0

(1) Monsanto Co. STP Code 067
(2) Union Carbide Co.
Dissolve 0.5 lb. in 1 gal. water.
Dilute with 25 gal. water for use.

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formulas

Carwash Powder

Ingredient:	Wt. %
Sodium Tripolyphosphate (1)	49.0
Sodium Hexametaphosphate (2)	5.0
Sodium Metasilicate (3)	20.0
Sodium Carbonate	10.0
Nonionic Surfactant	15.0
CMC	1.0

(1) Monsanto Code 101
(2) Monsanto Code 340
(3) PQ Corp., Metso Beads 2048

SOURCE: Monsanto Co.: Sodium Hexametaphosphate: Formula

Car Wash Powders
Premium Quality with Phosphate

	%w
Neodol 1-5	10.0
Sodium tripolyphosphate	80.0
Sodium metasilicate, anhydrous	10.0

Premium Quality Non-Phosphate

	%w
Neodol 1-5	10.0
Sodium carbonate	40.0
Sodium sesquicarbonate	40.0
Sodium metasilicate, anhydrous basis	10.0

Blending Procedure:
Mix solid builders thoroughly. Add Neodol 1-5 slowly while mixing, mix thoroughly.

Good Quality

	%w
Neodol 91-6	5.0
LAS (97%) (a)	5.0
Sodium carbonate	42.0
Sodium tripolyphosphate	40.0
Sodium metasilicate, anhydrous	8.0

Blending Procedure:
Adsorb LAS onto sodium carbonate, then mix with other solid builders thoroughly. Add Neodol 91-6 slowly while mixing, mix thoroughly.

(a) Linear alkylbenzene sulfonic acid such as Bio-Soft S-100, Stepan Co., or equivalent product

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Car Wash Concentrate

Monamine ALX-100S	32.0%
Water	68.0%

This concentrate can be diluted up to 5:1 with water and then siphoned into a normal automatic car washing system.

SOURCE: Mona Industries, Inc.: MONAMINE ALX-100S: Formula

Economy Car Wash (Concentrate)

Component:	wt.%
Alfonic 1412-A Ether Sulfate	7.5
Alfonic 810-60 Ethoxylate	25
DEA	2
Dye, fragrance, water	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 70
Cloud/clear (F): 18/32
pH: 10
Order of Addition:
DEA, Ether Sulfate, Nonionic, Water to 100%

Moderate Car Wash (Concentrate)

Component:	wt.%
Alfonic 1412-A Ether Sulfate	13.9
Alfonic 810-60 Ethoxylate	20
DEA	4
Ethanol	2
Dye, fragrance, water	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 60
Cloud/clear (F): 15/28
pH: 10
Order of Addition:
DEA, Ethanol, Ether Sulfate, Nonionic, Water to 100%

Premium Car Wash (Concentrate)

Component:	wt. %
C-550 LAS	10
Alfonic 1412-A Ether Sulfate	7.5
Alfonic 810-60 Ethoxylate	20
DEA	2
Dye, fragrance, water	q.s.

q.s.: quantity sufficient to make 100 percent

Properties:
Viscosity (cps) (25C): 150
Cloud/clear (F): 22/32
pH: 10
Order of Addition:
DEA, LAS, Ether Sulfate, Nonionic, Water to 100%

SOURCE: Vista Chemical Co.: Example Starting Formulations.

Heavy Duty Car Wash for Trucks

Ingredients:	% by Wt.
Water	75.0
EDTA	2.0
Sodium tripolyphosphate	5.0
Sodium metasilicate, pentahydrate	5.0
Bio-Soft D-62	4.0
Ninol 1281	9.0

Mixing Procedures:
Blend ingredients in order above
Properties:
Appearance: Clear, yellow liquid
Viscosity @ 25C, cps: 125
pH, as is: 12.0
Active, %: 22.5-24.5
Use Instructions:
Use concentration: 1:10 to 1:20. For use in spray equipment.

SOURCE: Stepan Co.: Formulation No. 119

Transportation Vehicle Cleaning Formulations
Pressure Wash

Water	86.5 Wt.%
Sodium Metasilicate (anhy.)	2.5
Tetrasodium Pyrophosphate	1.0
NaOH (50% Liquid)	4.5
Versene 100	1.5
Tomah AO-14-2	1.0
Tomah Q-14-2	1.0
Nonionic Surfactant (dilute 10:1 to 30:1)	2.0

pH: 12.5
SpG: 1.035 @ 74F.
Wt./Gal.: 8.62 @ 74F.

High Quality Car Wash Shampoo

Water	42.0 Wt. %
50% Caustic Soda	6.2
Dodecyl Benzene Sulfonic Acid*	23.8
Sodium Lauryl Ether Sulfate (60%)	15.0
Tomah AO-728 Special	3.0
Tomah Amphoteric L	5.0
Nonionic Surfactant	5.0

*(adjust to pH 7)
pH: 8.1
SpG: 1.063 @ 74F.
Wt./Gal.: 8.85 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Truck Wash
Good Quality Non-Phosphate

	%w
Neodol 1-5	4.0
Neodol 25-3S (60%)	2.0
Sodium metasilicate, pentahydrate	1.0
EDTA (a)	2.0
Butyl Oxitol glycol ether (b)	3.5
Potassium hydroxide (45%)	1.0
Sodium xylene sulfonate (40%)	4.0
Water, dye	to 100%

Properties:
Phase coalescence temp., F: 167
pH: 13

(a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
(b) Shell Chemical Co.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Truck Wash Detergent
(Powder)

Soil: Clay, particulate, grease, salt, etc.
Surface: Paint and anodized aluminum
Application Method: Spray, brush or wipe
Manufacture: Ribbon or paddle blender

Composition A:	%Wt
Sodium Carbonate	30.0
STPP	35.0
*Sodium Alkylaryl Sulfonate Flake (90%)	15.0
Metso Pentabead 20	20.0

Composition B:	%Wt
Sodium Carbonate	40.0
TSPP	25.0
**NonylphenoxyPolyethoxyethanol, 9-10 Moles EO	5.0
*Sodium Alkylaryl Sulfonate Flake (90%)	10.0
Metso Pentabead 20	20.0

Use Dilution: 0.5-2.0% bw (2/3-2 2/3 oz/gallon)

* Rohm & Haas, GAF
** Stepan, Witco

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Truck Wash
Premium Quality with Phosphate

	%w
Neodol 1-5	5.0
Neodol 25-3S (60%)	0.5
Tetrapotassium pyrophosphate	3.0
Sodium metasilicate, pentahydrate	2.0
EDTA (a)	6.0
Butyl Oxitol glycol ether (b)	3.5
Potassium hydroxide (45%)	3.0
Amphoteric (c)	2.0
Phosphate ester (d)	3.0
Sodium xylene sulfonate (40%)	3.0
Water, dye	to 100%

Properties:
Phase coalescence temp., F: 122
pH: 13.3

Good Quality with Phosphate

	%w
Neodol 1-5	3.0
C12 LAS (60%) (e)	0.9
Tetrapotassium pyrophosphate	5.0
Sodium metasilicate, pentahydrate	1.0
Butyl Oxitol glycol ether (b)	3.0
Phosphate ester (d)	2.0
Sodium xylene sulfonate (40%)	3.0
Water, dye	to 100%

Properties:
Phase coalescence temp., F: 158
pH: 12.5

High Quality Non-Phosphate

	%w
Neodol 91-6	3.5
Neodol 91-2.5	1.5
C12 LAS (60%) (e)	0.9
Sodium metasilicate, pentahydrate	1.0
EDTA (a)	2.0
Butyl Oxitol glycol ether (b)	3.5
Potassium hydroxide (45%)	1.0
Sodium xylene sulfonate (40%)	7.5
Water, dye	to 100%

Properties:
Phase coalescence temp., F: >149
pH: 13

(a) Ethylenediamine tetraacetic acid, tetrasodium salt (100%)
(b) Shell Chemical Co.
(c) Such as Miranol C2M-SF conc., Miranol Inc., or equivalent
(d) Triton H-66, Union Carbide Corp., or equivalent product
(e) Witconate 1260, Witco Corp., or equivalent product

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Vehicle Wash, Powder, Aluminum Brightening

Ingredient:	Wt. %
Sodium Tripolyphosphate (STP) (1)	68.0
Alcohol Ethoxylate (2)	10.0
G.D. Silicate (3)	12.0
NTA (4)	10.0

(1) Monsanto Co., Code 067
(2) Shell Chemical, Neodol 91.6
(3) PQ Corp.
(4) Monsanto Co., Code 000

Vehicle Wash, Liquid, Aluminum Brightening

Ingredient:	Wt. %
NTA (1)	10.0
RU Silicate (47%) (2)	10.0
Alcohol Ethoxylate (3)	3.0
Sodium Xylene Sulfonate (40%) (4)	7.5
Water	69.5

(1) Monsanto Co., Code 000
(2) PQ Corp.
(3) Shell Chemical, Neodol 91.6
(4) Stepan Co.

SOURCE: Monsanto Co.: NTA: Formulas

Vehicle Wash Powder (High Performance)

Ingredient:	Wt. %
Sodium Tripolyphosphate (1)	36.0
Tetrasodium Pyrophosphate (2)	30.0
Sodium Metasilicate, anhydrous	20.0
Sodium Alkylbenzene Sulfonate (3)	5.0
Neodol 91-6 (4)	8.0
Dequest 2006 Phosphonate (5)	1.0

(1) Monsanto Co. STP Code 101
(2) Monsanto Co. TSPP Code 101
(3) Such as Pilot Chem. Calsoft F-90
(4) Shell Chemical Co.
(5) Monsanto Co.

SOURCE: Monsanto Co.: Sodium Tripolyphosphate: Formula

16. Whitewall Tire Cleaners

Automobile Whitewall Tire Cleaner

	%w
Neodol 91-6 (a)	2.0
Sodium metasilicate, pentahydrate	8.7
Trisodium phosphate, dodecahydrate	8.7
C12 LAS (60%) (b)	1.6
Sodium xylene sulfonate (40%)	7.0
Water, dye and perfume	to 100%

Properties:
Viscosity, 73F, cps: 6
Phase coalescence temp., F: 148
pH: 13.6

a) Neodol 91-8 can be used in place of Neodol 91-6 with only very minor changes in physical properties.
b) Witconate 1260, Witco Corp., or equivalent product

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations for Cleaning Products: Formulas

Liquid White Wall Tire Cleaner

Ingredients:	% by Wt.
Water	78.3
Sodium metasilicate anhydrous	2.8
Trisodium phosphate	4.5
Sodium tripolyphosphate	4.5
Bio-Soft LD-190	4.7
Stepanate SXS	3.3
Bio-Terge PAS-8S	1.9

Mixing Procedure:
Blend ingredients in order given with good agitation
Properties:
Appearance: Clear liquid
Viscosity @ 25C. cps: 10.0
pH, as is: 12.4
Use Instructions:
Spray on and scrub/rinse off
Formulation No. 229

Stepan Co.: Formulations

White Wall Tire Cleaner

Ingredients:	% by Wt.
Water	87.8
Sodium Metasilicate, anhydrous	5.0
Trisodium Phosphate, anhydrous	5.0
Cedephos FA-600	0.9
Makon 10	1.3

Mixing Procedure:
Dissolve builders in water and add remaining ingredients while agitating. Mix until clear.

Typical Properties:
Appearance: Clear liquid
pH, as is: 13.0
Specific Gravity, g/ml: 1.09
Density, lbs/gal: 9.1
Viscosity @ 25C, cps: 5

Use Instructions:
Spray on tire and scrub with a stiff bristle brush. Allow to remain on tire for 30 seconds and rinse off with high pressure hose.

Storage Stability:
Formulation is freeze/thaw stable. It will return to its original appearance at room temp.
Formulation No. 322

White Wall Tire Cleaner

Ingredients:	% by Wt.
Water, DI or soft	87.8
Sodium metasilicate, anhydrous	5.0
Trisodium phosphate, anhydrous	5.0
Cedephos FA-600	0.9
Makon OP-9	1.3

Mixing Procedure:
Dissolve builders in water and add remaining ingredients while agitating. Mix until clear.

Typical Properties:
Appearance: Clear liquid
pH, as is: 13.1
Specific Gravity, g/ml: 1.1
Density, lbs/gal: 9.3
Viscosity @ 25C, cps: 5

Use Instructions:
Spray on tire and scrub with a stiff bristle brush. Allow to remain on tire for 30 seconds and rinse off with a high pressure hose.
Formulation No. 605

SOURCE: Stepan Co.: Formulations

Whitewall Tire Cleaner

Formulation:	Wt. %
Miranol CM emulsifier	20.0
Sodium metasilicate	27.0
Dowanol PM (or PnB) glycol ether	2.0
Potassium hydroxide (45%)	3.0
Water	14.0

Formulation No. 33

Whitewall Tire Cleaner

Formulation:	Wt. %
Dowanol DPM (or PnB) glycol ether	6.0
Ninol 11CM alkylolamide	0.6
Ninol 1281 alkylolamide	0.45
Stepanate	0.45
Witconate K surfactant	1.0
Versene 100 chelating agent	3.0
Sodium o-silicate	0.1
Water	88.4

Formulation No. 34

SOURCE: The Dow Chemical Co.: DOWANOL Glycol Ethers: Formulations

Whitewall Tire Cleaner

Water	70.0 Wt.%
Sodium Metasilicate Pentahydrate	25.0
Nonionic Surfactant	2.0
Tomah Alkali Surfactant	3.0

pH: 12.8
SpG: 1.165 @ 74F.
Wt./Gal: 9.70 @ 74F.

Whitewall Tire Cleaner

Water	67.4 Wt.%
Sodium Tripolyphosphate	5.0
45% KOH	15.6
42 Sodium Silicate 3.22/1	8.0
Tomah Alkali Surfactant	2.0
Nonionic Surfactant	2.0

pH: 13
SpG: 1.154 @ 74F.
Wt./Gal.: 9.61 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Whitewall Tire Cleaner

Ingredient:	Wt. %
Surfactant (1)	15.0
NTA (2)	5.0
Water	80.0

Use without further dilution
(1) Mona Industries, Inc., Monamine ALX-100S
(2) Monsanto Co., Code 000

SOURCE: Monsanto Co.: NTA: Formulations

Specialty Products White Wall Tire Cleaner

Components:	Parts by Wt.
Butyl Cellosolve	3.0
Niaproof Anionic 08	4.0
Water	90.0
Sodium Metasilicate	3.0

Preparation:
Dissolve the sodium metasilicate in the water. Add Butyl Cellosolve and finally Niaproof 08.
These formulations may be used as is or made into pastes by the addition of inorganic filler and white pigment.

SOURCE: Niacet Corp.: NIAPROOF Anionic Surfactants: Formula

17. Miscellaneous

Aircraft Cleaners
Solvent-Based

	%w
Neodol 25-3S (60%)	33.4
Sodium xylene sulfonate (40%)	5.0
Cyclo Sol 63 (a)	45.9
Shell Sol 340 (b)	9.7
Butyl Oxitol glycol ether (c)	6.0

Properties:
- Viscosity, 73F, cps: 14
- pH: 9
- (a) Aromatic hydrocarbon, flash point 142F, b.p. 358-410F. Shell Chemical Co.
- (b) Aliphatic naphtha; flash point 104F, b.p. 316-358F. Shell Chemical Co.
- (c) Shell Chemical Co.

Powder

	%w
Neodol 91-6	8.0
Neodol 25-3S (60%)	4.0
Tetrapotassium pyrophosphate	27.0
Sodium metasilicate, pentahydrate	30.0
Sodium tripolyphosphate	30.0
Sodium nitrite	1.0

High Quality Liquid

	%w
Neodol 91-6	2.0
Neodol 91-2.5	1.0
EDTA (a)	2.0
Potassium hydroxide (45%)	3.0
Butyl Oxitol glycol ether (b)	2.5
Sodium metasilicate, anhydrous basis	0.6
Phosphate ester (c)	2.0
Water, dye, presrvative	to 100%

Properties:
- Viscosity, 73F, cps: 5
- Phase coalescence temp., F: >160
- Clear point, F: 34
- Freeze-thaw test (3 cycles): Pass
- pH: 13.1
- (a) Ethylenediamine tetraacetic acid, tetrasodium salt (100% basis).
- (b) Shell Chemical Co.
- (c) Triton H-66, Union Carbide Corp., or equivalent product

SOURCE: Shell Chemical Co.: Neodol Starting Formulations

Aircraft Cleaner and Brightener

Ingredients:	% by Wt.
Citric acid	4.0
Phosphoric acid (75%)	8.0
Bio-Soft EA-10	7.0
Bio-Soft EA-8	7.0
Water, D.I.	74.0

Mixing Procedure:
Dissolve citric acid in heated water, add rest of the ingredients in the order shown above while agitating.

Properties:
Appearance: Clear liquid
pH, as is: 2.00
Solids, %: 24.00
Density, lbs/gal: 8.67

Use Instructions:
Recommended use level: 50% by volume in water. Apply to surface. Allow to remain on surface for about 10-15 minutes. Rinse thoroughly with water.

Performance:
An excellent exterior cleaner, brightener, and general conditioner.

Comment:
Normal precautions for handling acids should be observed.

SOURCE: Stepan Co.: Formulation No. 287

Aircraft Cleaner (Powder)

Soil: Particulates, carbon black, petroleum oil and grease
Surface: Metal
Application Method: Spray or brush
Manufacture: Ribbon or paddle blender

Composition:	% Wt
Metso Pentabead 20	30.0
STPP	30.0
Ammonium Bifluoride	8.0
TSPP	20.0
*Sodium Alkylnaphthalene Sulfonate	8.0
**Sodium Alkylaryl Sulfonate Powder (90%)	4.0

Use Dilution: 1.5-6.0% bw (2-8 oz/gal)
*DeSoto, Inc.
**Stepan, Witco

SOURCE: The PQ Corp.: PQ Formulary: Formulas

Aircraft Exterior Cleaner

Ingredients:	% by Wt.
Makon 10	10.0
Ninol 40-CO	5.0
Dowanol DPM	10.0
Water, D.I.	71.5
Cobratec 99	0.5
Hostacor 2098	2.0
Morpholine	1.0

Mixing Procedure:
Charge tank with water. Add Cobratec and mix until dissolved. Add and mix the solvents followed by the surfactants, mixing after each addition. Adjust pH to 8.0. Add remaining ingredients and mix until homogeneous and clear.

Properties:
Appearance: Clear straw liquid
Active, %: 29.5
pH, as is: 8.5-9.5

Use Instructions:
Spray 2-4 oz/gal. solution onto surface to be cleaned, scrub with mop or brush, and rinse.
Formulation No. 309

Aircraft Exterior Cleaner

Ingredients:	% by Wt.
Makon 10	10.0
Makon 12	10.0
Ninol 40-CO	5.0
Dowanol DPM	10.0
Hexylene glycol	8.0
Solvent G	10.0
Water, D.I.	43.5
Cobratec 99	0.5
Hostacor 2098	2.0
Morpholine	1.0

Mixing Procedure:
Charge tank with water. Add Cobratec and mix well until dissolved. Add solvents followed by the surfactants, mixing after each addition. Adjust pH to 8.0. Add remaining ingredients and mix until homogeneous and clear.

Properties:
Appearance: Clear straw liquid
Active, %: 56.5
pH, as is: 8.5-9.5

Use Instructions:
Spray 2-4 oz/gal. solution onto the surface to be cleaned, scrub with mop or brush, and rinse.
Formulation No. 310

SOURCE: Stepan Co.: Formulations

Creamy, Vinyl Surface Protectant

Formulation E2-9022A is a cream-type polish designed for use on various soft surfaces, such as vinyl, leather, rubber and plastics. This polish exhibits good gloss, and is resistant to multiple detergent washings.

Part:	Ingredients:	Percent by Weight
A	Witcamide 511	1.0
	Dow Corning 531 Fluid	2.0
	L-140 Solvent	23.0
B	Water	64.0
C	Dow Corning 929 Cationic Emulsion	8.5
D	Bentone 38	1.0
E	Anhydrous IPA	0.5

Preparation:

1. Load Part A into mixing vessel. Start agitation.
2. When Part A is uniform, slowly add water.
3. Slowly add Part C, when Part A and Part B are uniform.
4. Bentone 38 should be added by screening or sifting. This will aid incorporation with low-shear mixing.
5. When the above mixture is uniform, add IPA. Mix until uniform. Package.

Formulation E2-9022A

Liquid, Vinyl Surface Protectant

Formulation E2-7234 can be used on various soft surfaces such as vinyl, leather, rubber and platics. This formulation imparts excellent gloss to a vinyl surface and resists multiple detergent washings.

Ingredients:	Percent by Weight
Dow Corning 929 Cationic Emulsion	5.4
Dow Corning 347 Emulsion	9.9
Water	82.7
Makon or Makon 6	1.0
50% Solution of Sodium Citrate in Water	1.0
Acetic Acid	0.5

Preparation:

1. Load Dow Corning 929 Cationic Emulsion and Dow Corning 347 Emulsion into mixing vessel.
2. Start low-shear mixer.
3. Add water.
4. When mixture is uniform, premix Makon 4 (or Makon 6) and the sodium citrate solution. Slowly add premix to mixing vessel.
5. Mix until uniform. Package.

Formulation E2-7234

SOURCE: Dow Corning Corp.: Formulary: Formulas

Leather and Vinyl Cleaner

	Wt. %
Water	95.0
Sodium Tripolyphosphate	1.0
50% NaOH	2.0
Tomah Alkali Surfactant	1.0
Nonionic Surfactant	1.0

pH: 12.5
SpG: 1.020 @ 74F.
Wt./Gal.: 9.8 @ 74F.

Leather and Vinyl Cleaner

	Wt. %
Water	92.0
Versene 100	4.0
Sodium Metasilicate Pentahydrate	1.0
Nonionic Surfactant	1.0
Tomah Alkali Surfactant	1.0
Tomah Q-14-2	1.0

pH: 12
SpG: 1.019 @ 74F.
Wt./Gal.: 8.86 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Leather, Vinyl and Plastic Cleaner

	Wt. %
Igepal CO-630 surfactant	10.0
Dowanol PM (or PnB) glycol ether	5.0
Isopropanol	2.5
Amyl acetate	1.0
Water	81.5

SOURCE: Dow Chemical Co.: DOWANOL Glycol Ethers: Formula 36

Silicone Aerosol Spray for Battery Terminals & Rubber Lubrication

Formulation E2-7249 is excellent for use in protecting battery terminals from oxidation. It can also be used to: Lubricate and protect rubber weather stripping and grommets on windows, doors, car hoods, and trunk lids. This formulation will also prevent the sticking of rubber to metals, prolong the life of rubber parts, and eliminate miscellaneous squeaks.

Ingredients:	Percent by Weight
200 Silicone Fluid by Dow Corning, 60,000 cs.	0.5
Chlorothene	28.5
Propellant of choice	66.5

Preparation:

Pressure or cold fill using a tin plate aerosol can with a #1 precision valve, a 0.018 stem, and a 0.018 regular button.

Use Instructions:

Spray clean surfaces lightly and evenly by holding aerosol nozzle 6 to 12 inches away.

SOURCE: Dow Corning Corp.: Formulary: Formulation E2-7249

Underbody Rust Inhibitor

	Wt. %
Tomah PA-14 Acetate	15.0
Isopropanol (99%)	5.0
Water	80.0

pH: 7.2
SpG: 0.9833 @ 74F.
Wt./Gal.: 8.19 @ 74F.

Concrete Truck Cleaner

	Wt. %
32% HCl	97.0
Tomah Acid Foamer (dilute 10:1)	3.0

pH: N.A.
SpG: 1.178 @ 74F.
Wt./Gal.: 9.8 @ 74F.

Fiberglass/Boat Cleaner

	Wt. %
10% Hydrochloric Acid	99.0
Tomah Acid Foamer	0.5
Tomah Amphoteric L	0.5

pH: 1.3
SpG: 1.053 @ 74F.
Wt./Gal.: 8.77 @ 74F.

SOURCE: Exxon Chemical Co.: 1992 Formulary: Formulas

Windshield Washer Cleaners

High Quality

	%w
Neodol 25-12	1.5
Neodol 25-3S (60%)	2.0
Isopropyl alcohol	47.5
Water, dye	to 100%

Properties:
- Viscosity, 73F, cps: 4
- Phase coalescence temp., F: >165
- pH: 7.0

Recommended Dilution:
- Dilute 1 part cleaner with 2 parts water.

Good Quality

	%w
Neodol 23-6.5	1.0
Isopropyl alcohol	39.0
Water, dye	to 100%

Properties:
- Viscosity, 73F, cps: 7
- Phase coalescence temp., F: >165
- pH: 6.5

Recommended Dilution:
- Dilute 1 part cleaner with 1 part water.

Winter Use

	%w
Neodol 91-8	1.0
Butyl Oxitol glycol ether (a)	5.0
Propylene glycol	14.0
Isopropyl alcohol	60
Water, dye	to 100%

Properties:
- Viscosity, 73F, cps: 7
- Phase coalescence temp., F: >165
- Flash Point, closed cup, F:
  - NEAT: 70
  - Diluted (1:1): 78
- pH: 7

Recommended Dilution:
- Winter use: 1 part cleaner with 1 part water.
- Summer use: May dilute to 1 part cleaner with 5 parts water.
- (a) Shell Chemical Co.

SOURCE: Shell Chemical Co.: NEODOL Starting Formulations

Section III
Trademarked Raw Materials

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Accosoft 440-75	Quaternary ammonium compound	Stepan
Accosoft 540	Quaternary ammonium compound	Stepan
Accosoft 550 HC	Quaternary ammonium compound	Stepan
Accosoft 550-990 HHV	Quaternary ammonium compound	Stepan
Accosoft 550L-90	Quaternary ammonium compound	Stepan
Accosoft 580	Quaternary ammonium compound	Stepan
Accosoft 620-90	Quaternary ammonium compound	Stepan
Accosoft 750	Quaternary ammonium compound	Stepan
Accosoft 808	Quaternary ammonium compound	Stepan
Accosoft 808-90	Quaternary ammonium compound	Stepan
AC-325 Nonionic	Polymer	Allied
ACL-56	Chlorinating compound	Monsan
ACL-60	Chlorinating compound	Monsan
Acrysol ASE-108 Thickener	Acrylic emulsion copolymer thickener/stabilizer. High mol wt	Rohm& Haas
Acrysol LMW-45 Thickener	Water-soluble acrylic resin	Rohm& Haas
Actinol FA-2	Tall oil fatty acid	Arizon
Adogen 470-75%	Quaternary	Sherex
Alfonic 810-40	Ethoxylate. HLB: 8.0	Vista
Alfonic 810-60	Ethoxylate. HLB: 12.0	Vista
Alfonic 1012-40	Ethoxylate. HLB: 8.0	Vista
Alfonic 810-60	Ethoxylate. HLB: 8.0	Vista
Alfonic 1412-A	Ethoxylate.	Vista
Alfonic 1412-60	Ethoxylate. HLB: 12.0	Vista

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Alfonic 1412-S	Ethoxylate.	Vista
Alipal CD-128 Surfactant	Ammonium salt of sulfated linear alcohol ethoxylate	GAF
Alkali Surfactant	Caustic stable surfactant hydrotrope	Exxon
Alkawet CF Surfactant	Phosphate ester	Lonza
Alpha-Step LD-200	Alpha sulfo methyl ester	Stepan
Alpha-Step ML-40	Alpha sulfo methyl laurate, sodium salt	Stepan
Alpha-Step ML-A	Alpha sulfo methyl laurate, sodium salt	Stepan
Ammonyx LO	Lauramine oxide	Stepan
Ammonyx 485	Amine oxide	Stepan
Amphoterge K Surfactant	Sodium cocoamphopropionate	Lonza
Amphoterge K-2 Surfactant	Disodium cocoamphodipropionate	Lonza
Amphoterge KJ-2 Surfactant	Disodium capryloamphodipropionate	Lonza
Amphoterge J-2 Surfactant	Disodium capryloamphodiacetate	Lonza
Amphoterge SB Surfactant	Sodium cocoamphohydroxypropylsulfonate	Lonza
Amphoteric L	Amphoteric cationic surfactant (35% active)	Exxon
Anionic APS	Hypochlorite stable surfactant	Burlington

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Armosoft WA-104	Cationic surfactant (75% active)	Akzo
Aromatic 150	Narrow-cut aromatic solvent	Exxon
Arosurf TA-100 Surfactant	Ethoxylated alcohol	Sherex
Attagel 50	Colloidal attapulgite thickening agent	Engel-hard
Avanel S-74 Surfactant	Sodium linear alkyl polyether sulfonate	PPG
Avanel S150 Surfactant	Sodium linear alkyl polyether sulfonate	PPG
Bardac 2250	Quaternary ammonium compounds	Lonza
Bareco C-36 Wax	Oxidized hydrocarbon wax. MP:198F.	Bareco
Barlox C	Amine oxide	Lonza
Barlox 12	Amine oxide	Lonza
Barquat MB-50	Quaternary ammonium compound	Lonza
Bentone 38	Rheological additive	Rheox
Berkeley 160 Mesh Supersil	Silica abrasive	Penn. Glass
Berkeley 230 Mesh Supersil	Silica abrasive	Penn. Glass
Bio-Soft CS-460 Surfactant	Sulfonic acid	Stepan
Bio-Soft D-40 Surfactant	Sodium alkylbenzene sulfonate, linear. Active: 40%	Stepan
Bio-Soft D-62 Surfactant	Sodium alkylbenzene sulfonate, linear	Stepan
Bio-Soft EA-8	Surfactant	Stepan
Bio-Soft EA-10	Surfactant	Stepan

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Bio-Soft LD-195	Surfactant	Stepan
Bio-Soft LD-150	Surfactant	Stepan
Bio-Soft LD-190	Surfactant	Stepan
Bio-Soft N-300 Surfactant	TEA alkylbenzene sulfonate,linear	Stepan
Bio-Soft S-100 Surfactant	Alkylbenzene sulfonic acid, linear	Stepan
Bio-Terge AS-40	Sodium C14-16 olefin sulfonate	Stepan
Bio-Terge PAS-85	Sodium 1-octane sulfonate	Stepan
Blankophor TX		
Britesil C-20	Sodium silicate	PQ
Britesil C24	Sodium silicate	PQ
Britesil H2O	Sodium silicate	PQ
Britesil H24	Sodium silicate	PQ
BTC 99	Quaternary ammonium compound	Stepan
BTC 776 (50% active)	Quaternary ammonium compound EPA Reg. No. 1839-18	Stepan
BTC 885 (50% active)	Quaternary ammonium compound EPA Reg. No. 1839-113	Stepan
BTC 1010 (80% active)	Quaternary ammonium compound EPA Reg. No. 1839-135	Stepan
BTC 2125M-P40 (40% active)	Quaternary ammonium compound EPA Reg. No. 1839-55	Stepan
BTC 2125M (50% active)	Quaternary ammonium compound EPA Reg. No. 1839-46	Stepan
Burco AAS-40	Proprietary textile auxiliary	Burlington
Burco FAE	Proprietary textle auxiliary	Burlington

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Burco LAF-125	Proprietary textile auxiliary	Burl-ington
Burco TM-HF	Proprietary textile auxiliary	Burl-ington
Burco TME	Proprietary textile auxiliary	Burl-ington
Burcosol ADS-40	Proprietary textile dyestuff	Burl-ington
Burcosolv TM	Water soluble solvent mixture	Burl-ington
Burcosperse AP Liquid	Low molecular weight sodium polyacrylate solution	Burl-ington
Burcoterge DG-40	Detergent concentrate	Burl-ington
Burcotreat 900-A	Free acid version of Burcosperse AP liquid	Burl-ing-
Burcowet TMW	Linear alcohol ethoxylate	Burl-ington
Butyl Carbitol	Industrial solvent	Union Carbide
Butyl Cellosolve	Ethylene glycol monobutyl ether solvent	Union Carb-
Butyl Dioxitol	Diethylene glycol monobutyl ether solvent	Shell
Butyl Oxitol	Ethylene glycol monobutyl ether solvent	Shell
Butyl Propasol	Industrial solvent	Union Carb-

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
C-340 Carnauba Wax Emulsion		Exxon
Calamide C	Liquid coconut diethanolamide super amide	Pilot
Calamide O	Super amide	Pilot
Calfoam NEL-60	Linear primary alcohol ethoxy-sulfate liquid (50% active)	Pilot
Calimulse	Emulsifier	Pilot
Calimulse PRS	Emulsifier	Pilot
Caloxylate N-9		Pilot
Calsoft F-90 Flake	Sodium dodecylbenzene sulfonate (90% active)	Pilot
Calsoft F-100	Linear alkylate sulfonate	Pilot
Calsoft L-40	Linear sodium dodecylbenzene sulfonate	Pilot
Calsoft L-60	Sodium alkylbenzene sulfonate (60%)	Pilot
Calsoft LAS-99	Dodecylbenzene sulfonic acid (60% active)	Pilot
Calsoft T-60	Linear triethanolamine dodecyl-benzene sulfonate (60% active)	Pilot
Calsuds A	Liquid detergent blend of sulfon-ate, hydrotrope. Super amide.	Pilot
Calsuds CD-6	Coconut oil amide combined with sulfonate (100% active)	Pilot
Carbopol 616	Acrylic acid polymer	Good-rich
Carbopol 681-X1	Acrylic acid polymer	Good-rich
Carbopol 934	Acrylic acid polymer. MW: 3,000,000	Good-rich

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Carsamide CA	Alkanolamide	Lonza
Carsonol SES-A (60%)	Ammonium lauryl ether sulfate	Lonza
Carsonol SES-S	Sodium lauryl ether sulfate	Lonza
Carsonol SHS	Sodium 2-ethyl hexyl sulfate	Lonza
CDB Clearon	Sodium dichloroisocyanurate	Olin
Cedemide CX		Miran-
Cedephos FA-600 Surfactant	Phosphate ester, anionic	Miran-
Cedepon LS-30M		Miran-
Cerasynt IP		Miran-
Cheelox BF-13		
CMC-CM8S	Sodium carboxymethylcellulose	Aqualon
Cobratec 99	Copper corrosion and stain inhibitor	PMC
Co-Wax	Wax with base melt point of 184F	Concord
Cyclo Sol 53	Aromatic hydrocarbon, b.p. 325-349F	Shell
Cyclo Sol 63	Aromatic hydrocarbon, b.p. 358-410F	Shell
Dantogard	DMDM hydantoin	Lonza
Dequest 2000 (50% sol.)	Organophosphorus product	Monsan
Dequest 2010	Organophosphorus product	Monsan
Dowanol DB	Diethylene glycol butyl ether solvent	Dow
Dowanol BD	Glycol ether solvent	Dow

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Dowanol DMP	Glycol ether	Dow
Dowanol DPM Glycol Ether	Dipropylene glycol methyl ether solvent	Dow
Dowanol EB Glycol Ether	Ethylene glycol n-butyl ether	Dow
Dowanol PM Glycol Ether	Propylene glycol methyl ether	Dow
Dowanol PnB	Glycol ether	Dow
Dow Corning HV-490	Silicone emulsion	DowCor
Dow Corning Z-6018	Silicone resin	DowCor
Dow Corning 20	Silicone coating	DowCor
Dow Corning 37 Emulsion	Polydimethylcyclosiloxane	DowCor
Dow Corning 346	Polydimethylcyclosiloxane	DowCor
Dow Corning 347	Silicone emulsion	DowCor
Dow Corning 531	Silicone fluid	DowCor
Dow Corning 536	Silicone fluid	DowCor
Dow Corning 929	Silicone cationic emulsion (35% silicone)	DowCor
Dow Corning 1101	Silicone emulsion	DowCor
Dow Fax 2A	Anionic surfactant	Dow
Dowfax 2AO Surfactant	Alkylated diphenyl oxide disulonate (40% active)	Dow
Dowfax 2A1 Surfactant	Alkylated diphenyl oxide disulfonate (45% active)	Dow
Dowfax 8390	Anionic surfactant (C16 alpha-olefin)	Dow
Dowicide A1	Antimicrobial	Dow

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Dowicide 1	Antimicrobial	Dow
Dowicil 75	Antimicrobial	Dow
E	Silicate	PQ
Emulsifier WHC		
Experimental Surfactant XDS 40341	Hexadecyldiphenyloxide disulfonate (95% active, dry)	Dow
Fluorad FC-129	Potassium fluorinated alkyl carboxylates anionic	3M
Gafac RA-600 Surfactant	Acid ester based on linear alcohol (99% active)	GAF
Gafamide CDD-518	Specialty surfactant amine	GAF
Gantrez AN-149	Polymer	GAF
G.D. Silicate	Silicate	PQ
Glycosperse L-20	Polyoxyethylene sorbitan fatty acid ester	Lonza
Goodrite K-7058N	Sodium polyacrylate	BFGood
Hampene 100 (40% active)	EDTA chelating agent	Grace
Hamposyl L-30	Fatty acid sarcosinate	Grace
Hoechst Wax E	Ester type wax. Drop point: 175F	Hoech-

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Hoechst Wax LP	Hard acid wax based on montan wax. Drop point: 84C	Hoech-
Hoechst Wax V	Wax	Hoech-
Hostacor 2098		Hoech-
Igepal CO-430 Surfactant	Nonyl phenoxy poly(ethyleneoxy) ethanol. Mol ratio: 4.	GAF
Igepal CO-630 Surfactant	Nonyl phenoxy poly(ethyleneoxy) ethanol. Mol ratio: 9.	GAF
Igepal CO-710 Surfactant	Nonyl phenoxy poly(ethyleneoxy) ethanol. Mol ratio: 10-11.	GAF
Igepal CO-977 Surfactant	Highly water soluble surfactant. (70% active)	GAF
Isopar K Solvent	Isoparaffinic solvent. IBP: 350F.	Exxon
Kaopolite SF	Anhydrous aluminum silicate. 0.70 microns.	Kaopol
Kaopolite SF-O	Anhydrous aluminum silicate.	Kaopol
Kaopolite 1152	Anhydrous aluminum silicate.	Kaopol
Kaopolite 1168	Anhydrous aluminum silicate. 1.8 microns.	Kaopol
Kasil #1	Liquid potassium silicate. Weight ratio: 2.50.	PQ
Kasil #6	Liquid potassium silicate. Weight ratio: 2.10	PQ
Kelzan Gum Thickener	Xanthan gum (powdered)	Kelco
Kessco EGDS	Fatty ester.	Stepan
Kessco EGMS	Fatty ester.	Stepan

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Kessco Cetyl Alcohol		Stepan
Kessco Glycerol Monostearate		Stepan
Koraid		Kaopol
Korthix Thixotropic Agent	Refined white bentonite	Kaopol
Korthix H Thixotropic Agent	Refined white bentonite	Kaopol
L-140 Solvent		
Larostat 477	Antistat	PPG
Lexaine C	Cocoamidopropyl betaine (30%)	Inolex
Lonzaine CO	Betaine amphoteric	Lonza
Lonzaine CS	Betaine amphoteric	Lonza
Lytron 300 Latex	Polystyrene emulsion	Morton
Lytron 305 Latex	Polystyrene emulsion	Morton
Macaloid Clay	Suspending agent	Rheox
Makon NF-5 Surfactant	Polyoxalkylated aliphatic base surfactant (97% active)	Stepan
Makon OP-9 Surfactant	Nonionic	Stepan
Makon 4 Surfactant	Nonoxynol-4 surfactant	Stepan
Makon 6 Surfactant	Nonoxynol-6 surfactant	Stepan
Makon 8 Surfactant	Nonoxynol-8 surfactant	Stepan
Makon 10 Surfactant	Nonoxynol-10 surfactant	Stepan

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Makon 12 Surfactant	Nonoxynol-12 surfactant	Stepan
Mazon 41 Surfactant	Ammonium salt of an alkylphenol ethoxylate	PPG/Ma
Metso Anhydrous Silicate	Sodium metasilicate anhydrous	PQ
Metso Beads 2048	Sodium metasilicate, anhydrous	PQ
Metso Pentabead 20	Sodium metasilicate, pentahydrate	PQ
Metso 204B	Sodium metasilicate anhydrous	PQ
Miranate LEC	Sodium laureth-13-carboxylate	Miran
Miranol BT Surfactant		Miran
Miranol CM Surfactant	Cocoamphoglycinate	Miran
Miranol CM-SF Conc. Surfactant	Cocoamphopropionate	Miran
Miranol C2M-SF Conc. Surfactant	Cocoamphocarboxypropionate amphoteric	Miran
Miranol JEM Conc. Surfactant	Mixed C8 amphocarboxylates amphoteric	Miran
Miranol J2M Conc. Surfactant	Caprylamphocarboxypropionate amphoteric	Miran
Miranol J2M-SF Surfactant	Caprylamphocarboxypropionate amphoteric	Miran
Miranol SM Conc. Surfactant	Caproamphoglycinate	Miran
Mirataine ASC Surfactant	Alkylether hydroxypropylsultaine	Miran
Mirataine CB Surfactant	Cocoamidopropyl betaine amphoteric	Miran
Mirataine COB Surfactant	Cocoamidopropyl and oleamidopropyl betaine	Miran
Mirataine H2C Surfactannt	Disodium lauriminodipropionate	Miran

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Mirawet ASC Surfactant	Alkylether hydroxypropyl sultaine	Miran
Mirawet FL Surfactant	Proprietary composition modified amphoteric	Miran
ML-850 Latex (38%)	Polymer emulsion	Morton
ML-870 Latex (38%)	Acrylic polymer emulsion	Morton
ML-877 Latex	Acrylic polymer emulsion	Morton
Mona AT-1200 Surfactant	Concentrated biodegradable acid thickener surfactant	Mona
Monafax 057 Surfactant	Organic phosphate ester surfactant	Mona
Monafax 1293 Surfactant	Organic phosphate ester surfactant	Mona
Monamine ALX-100S Concentrate	1:2 FA-diethanolamide. Mixed coconut fatty acid (100% active)	Mona
Monamulse dL-1273	Proprietary emulsifier/solubilizer	Mona
Monamulse 653-C	Proprietary emulsifier/solubilizer	Mona
Monamulse 947	Proprietary emulsifier/solubilizer	Mona
Monaterge 85 Surfactant	Biodegradable fatty acid amido complex	Mona
Monateric CA-35 Surfactant	Cocoamphopropionate	Mona
Monateric CEM-38 Surfactant	Cocoamphocarboxypropionate	Mona
Monateric CyNa-50 Surfactant	Caprylamphopropionate	Mona
Monateric LF-100 Surfactant	Mild amphoteric	Mona
Monatrope 1296 Surfactant	Organic phosphate ester	Mona

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Monateric 1188M Surfactant		Mona
Monatrope 1250 Surfactant	Sodium alkanoate (anionic)	Mona
Monatrope 1296 Surfactant	Organic phosphate ester	Mona
Monawet SNO-35 Surfactant	Tetrasodium dicarboxyethyl sulfo-succinate	Mona
Monazoline Cy Surfactant	1-hydroxyethyl-2-alkylimidazoline FA: Caprylic	Mona
Mor-Flo 16 Latex (40%)	Metal cross-linked styrene/acrylic copolymer of high solids	Mona
Mor-Flo 155 Latex (38%)	Aqueous acrylic emulsion	Morton
Mor-Flo 424 Latex (36%)	Modified stryene polyacrylate copolymer	Morton
Mor-Flo 430 Latex (36%)	Modified polyacrylic latex	Morton
Mor-Glo 2 Latex	Floor polish latex (38%)	Morton
Mor-Glo 4 Latex	Floor polish latex (38%)	Morton
Morton Conrez 510	Polymer emulsion	Morton
Morton Resin E-295	Opacifier	Morton
N Clear	Sodium silicate	PQ
N Silicate	Sodium silicate	PQ
Nacconol 90G Surfactant	Alkylate sulfonic acid, sodium salt	Stepan
Natrosol 250MR Thickener	Hydroxyethyl ether of cellulose	Aqualo

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Neodol 1-5 Ethyoxylate	Alcohol ethoxylate	Shell
Neodol 23-3 Ethoxylate	Linear primary alcohol	Shell
Neodol 23-6.5 Ethoxylate	Linear primary alcohol. MW: 484. 6.5 EO groups.	Shell
Neodol 25-3 Ethoxylate	Linear primary alcohol. MW: 336. 3 EO groups.	Shell
Neodol 25-3A (60%)	Alcohol ethoxylate	Shell
Neodol 25-3S	Ethoxysulfate. Sodium cation. 59% active.	Shell
Neodol 25-7 Ethoxylate	Linear primary alcohol. MW: 519. 7.2 EO groups.	Shell
Neodol 25-9 Ethoxylate	Linear primary alcohol. MW: 610. 9 EO groups.	Shell
Neodol 25-12 Ethoxylate	Linear primary alcohol. MW: 729. 12 EO groups.	Shell
Neodol 45-2.25	Alcohol ethoxylate	Shell
Neodol 91-2.5 Ethoxylate	Linear primary alcohol. 2.5 EO groups.	Shell
Neodol 91-6 Ethoxylate	Linear primary alcohol. MW: 425. 6 EO groups.	Shell
Neodol 91-8 Ethoxylate	Linear primary alcohol. MW: 529. 8.4 EO groups.	Shell
Neutronyx 100	Surfactant	Stepan
Neutronyx 656	Nonionic surfactant	Stepan
NFB 85 Phosphoric Acid		Monsan
Niaproof Anionic 08	Surfactant	Niacet
Ninate 411 Surfactant	Alkylamine dodecylbenzene sulfonate (93% active)	Stepan
Ninol 11-CM	Coconut diethanolamide, modified	Stepan

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Ninol 30-LL Surfactant	Lauric diethanolamide	Stepan
Ninol 40CO Surfactant	Coconut diethanolamide	Stepan
Ninol 49CE Surfactant	Fatty acid diethanolamide	Stepan
Ninol 96-SL Surfactant	Lauramide DE	Stepan
Ninol 1281 Surfactant	Fatty acid alkylolamide (100% active)	Stepan
Ninol 1285 Surfactant	Fatty acid base alkylolamide (100% active)	Stepan
Ninol 2012 EX Surfactant	Methyl cocoate alkylolamide (100% active)	Stepan
Ninol 5024 Surfactant	Fatty diethanolamide, modified	Stepan
NM-90 Latex (38%)	Polymer emulsion	Morton
NM-91 Latex (38%)	Polymer emulsion	Morton
NM-128 Latex (38%)	Polymer emulsion	Morton
N-Silicate	Sodium silicate	PQ
Opacifier E-295	Latex opacifier (40% solids)	Morton
Opacifier E-305	Latex opacifier (40% solids)	Morton
Orvus K Liquid		
Petrolite P-25 Wax		Bareco
Petronauba D Wax	Oxidized microcrystalline wax	Bareco
Phosphoteric T-C	Hydrotroping surfactant	Mona
Phosphoteric T-C6	Hydrotroping surfactant	Mona
Pilot SXS-40 Hydrotrope	Liquid sodium xylene sulfonate (40% active)	Pilot
Pilot SXS-96 Hydrotrope	Powdered sodium xylene sulfonate (96% active)	Pilot

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Plurafac D-25 Surfactant	Linear alcohol alkoxylate. MW:930	BASF
Plurafac RA-40 Surfactant	Linear alcohol alkoxylate. MW:820.	BASF
Plurafac RA-43 Surfactant	Linear alcohol alkoxylate.	BASF
Pluronic 25R2 Polyol	Block copolymer nonionic. MW: 3,100	BASF
Poly-Tergent B-300 Surfactant	Ethoxylated nonylphenol. 9.0 moles EO.	Olin
Poly-Tergent B-350 Surfactant	Ethoxylated nonylphenol. 10.5 moles EO.	Olin
Poly-Tergent S-305LF Surfactant	Alkoxylated linear alcohol nonionic surfactant, low foam	Olin
Poly-Tergent SL-42 Surfactant	Biodegradable alkoxylated linear alcohol	Olin
Poly-Tergent SL-62 Surfactant	Biodegradable alkoxylated linear alcohol	Olin
Poly-Tergent SL-92 Surfactant	Biodegradable alkoxylated linear alcohol	Olin
Poly-Tergent SLF-18 Surfactant	Alkoxylated linear alcohol	Olin
Proxel GXL	Chemical biocide	ICI
Proxycarb 135	Sodium percarbonate	River-
PVP-K30	Vinylpyrrolidone polymer	GAF
Pylaklor Brown LX4911		Stepan
Renex 698 Surfactant	Detergent	ICI
RU Silicate	Sodium silicate (47%)	PQ
SAG 1010	Silicone antifoam	Union Carb

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Sandopan DTC-100	Conc. wetting agent	Sandoz
Sandoz AS Optical Brightener		Sandoz
SF96 Silicone (350)	Polydimethyl silicone fluid (350 cts.)	GE
SF 1705	Silicone	GE
SF 1706	Silicone	GE
Shell Mineral Spirits 145, 150 or 150 EC		Shell
Shell Sol 71	Solvent	Shell
Shell Sol 72	Solvent	Shell
Shell Sol 140	Solvent	Shell
Silicone AFL-40	Silicone	Union Carb
Sipernat 50	Spray-dried silica	Deguss
Sipex BOS Lauryl Sulfate	Sodium lauryl sulfate	Alcol-
Siponic SK Surfactant	Alkoxylated nonionic surfactant	Alcol-
Snow Floss Silica	Processed diatomaceous silica	JM
Snowlite JG	Light density soda ash	Neos
Sodium Silicate G	Sodium silicate	PQ
Solvent G		
SO/SAN 30M (26% Active)		Stepan
Starch #5541		
"Star" Silicate	Sodium silicate	PQ
Starso	Liquid sodium silicate	PQ
Steol CA-460 Surfactant	Fatty ether sulfate. Sodium cation. (60% active)	Stepan

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Steol CS-330 Surfactant	Alcohol ether sulfate	Stepan
Steol CS-460 Surfactant	Alcohol ether sulfate	Stepan
Stepanate Surfactant	Hydrotrope	Stepan
Stepanate SXS Surfactant	Sodium xylene sulfonate	Stepan
Stepanate X Surfactant	Xylene hydrotrope. Sodium cation.	Stepan
Stepanol WA-Special Surfactant	Fatty alcohol alkyl sulfate. Sodium cation.	Stepan
Stepanol WAC Surfactant	Alkyl sulfate	Stepan
Stepantan DS-40	Sulfonate based surfactant	Stepan
Surfamide (WC-Con)		
Surfonic HDL Surfactant	Surface-active agent	Texaco
Surfonic JL-80X Surfactant	Surface-active agent	Texaco
Surfonic L12-6 Surfactant	Surface-active agent	Texaco
Surfonic L24-3 Surfactant	Surface-active agent	Texaco
Surfonic L24-7 Surfactant	Seven-mole ethylene oxide adduct of linear, primary 12-14 carbon number alcohol	Texaco
Surfonic L24-9 Surfactant	Nine-mole ethylene oxide adduct of linear, primary 12-14 carbon number alcohol	Texaco
Surfonic LF-17 Surfactant	Ethoxylated and propoxylated linear primary 12-14 carbon number alcohol.	Texaco
Surfonic LF-37 Surfactant	Surface-active agent	Texaco
Surfonic N-40 Surfactant	Surface-active agent	Texaco

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Surfonic N-60 Surfactant	Nonionic	Texaco
Surfonic N-85 Surfactant	Nonionic	Texaco
Surfonic N-95 Surfactant	Nonionic	Texaco
Surfonic N-100 Surfactant	Nonionic	Texaco
Surfonic N-102 Surfactant	Nonionic	Texaco
Surfonic N-120 Surfactant	Nonionic	Texaco
Surfonic N-150 Surfactant	Nonionic	Texaco
SWS F-96 Silicone Fluid	Silicone	SWS
SWS 211 Silicone Emulsion	Silicone	SWS
Synotol LM-60		
Tergitol 15-S-5 Surfactant	Linear alcohol. 5 mols EO.	Union Carb
Tergitol 15-S-9 Surfactant	Linear alcohol. 9 mols EO.	Union Carb
Tergitol 24-L-60 Surfactant	Specialty nonionic	Union Carb
Tergitol 25-L-9 Surfactant	Specialty nonionic	Union Carb
Tergitol NP-9 Surfactant	Specialty nonionic	Union Carb
Tergitol NPX Surfactant	Specialty nonionic	Union Carb
Tergitol TMN-6 Surfactant	Specialty nonionic	Union Carb
Texsolve E Solvent		Texaco
Texsolve S-LO	Mineral spirit	Texaco
Texstim 8741	Nonionic surfactant	Exxon
Tinopal AMS	Whitening agent	Ciba-Geigy

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Tinopal CBS-X Whitening Agent	Distearyl biphenyl disulfonate derivative.	Ciba-Geigy
Tinopal RBS-200% Whitening Agent	Naphthotriazolistilbene monosulfate derivative. Fluorescent.	Ciba-Geigy
Tinopal SWN-Conc.	Whitening agent	Ciba-Geigy
Tinopal UNPA	Whitening agent	Ciba-Geigy
Tinopal 5BM Extra Conc.	Whitening agent	Ciba-Geigy
Tomah Acid Foamer	Cationic surfactant	Exxon
Tomah Acid Thickener	Cationic surfactant	Exxon
Tomah Alkali Surfactant	35% active amphoteric	Exxon
Tomah AO-14-2	Ether amine oxide	Exxon
Tomah Amphoteric L	Mild surfactant	Exxon
Tomah AO-728 Special	Proprietary amine oxide	Exxon
Tomah Emulsifier Four	Dialkyl quaternary	Exxon
Tomah Q-14-2		Exxon
Tomah PA-14 Acetate		Exxon
Tomah PIB-T		Exxon
Triton CF-10 Surfactant	Alkylaryl polyether nonionic (100% active)	Union Carb
Triton CF12 Surfactant	Nonionic surfactant	Union Carb
Triton CF-21 Surfactant	Alkylaryl polyether nonionic (100% active)	Union Carb
Triton CF-54 Surfactant	Modified polyethoxy adduct nonionic (100% active)	Union Carb

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Triton CF-76 Surfactant	Modified polyethoxy adduct nonionic (100% active)	Union Carb
Triton CF-101 Surfactant		Union Carb
Triton DF-12 Surfactant	Modified polyethoxylated alcohol nonionic (100% active)	Union Carb
Triton DF-16 Surfactant	Terminated ethoxylated linear alcohol nonionic (100% active)	Union Carb
Triton H-55 Hydrotrope	Anionic phosphate ester compound	Union Carb
Triton H-66 Hydrotrope	Phosphate ester, salt from anionic (50% active)	Union Carb
Triton N-57 Surfactant	Nonionic surfactant	Union Carb
Triton N-101 Surfactant	Nonylphenol. 9-10 mols EO. Nonionic. 100% active.	Union Carb
Triton QS-44 Surfactant	Phosphate ester, acid form, anionic (80% active)	Union Carb
Triton X-45 Surfactant	Octylphenol. 5 mols EO. Nonionic. (100% active)	Union Carb
Triton X-100 Surfactant	Octylphenol. 9-10 mols EO. 100% active.	Union Carb
Triton X-102 Surfactant	Octylphenol. 12-13 mols EO. 100% active.	Union Carb
Triton X-114 Surfactant	Octylphenol. 7-8 mols EO. 100% active.	Union Carb
Triton X-301 Surfactant	Sodium alkylaryl polyether sulfate. Anionic. 20% active.	Union Carb
Triton XL-80N Surfactant		Union Carb
Tronalight	Light density soda ash	Kerr-McGee

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Tween 80 Surfactant	Polyoxyethylene (20) sorbitan monooleate	ICI
Unamide C-72-3	Alkylolamide	Lonza
Unamide D-10	Alkylolamide	Lonza
Unamide LDL	Alkylolamide	Lonza
Unihib 305-LC	Phosphonate	Lonza
Unipine NCL	Pine oil. Reg. No. 9886-9	Stepan
Unipine 85	Pine oil	Stepan
Valfor 100	Zeolite A builder	PQ
Van Gel ES Thixotrope	Natural smectite clay	Vander
Varion TEG	Tallow glycinate	Sherex
Varisoft 222LT-90%	Softener	Sherex
Varisoft 3690-75%	Softener	Sherex
Varonic T-202	Tallow amine ethoxylate	Sherex
Varsol	Mineral spirits	Exxon
Veegum Stabilizer	Complex colloidal magnesium aluminum silicate	Vander
Veegum HS Stabilizer	Complex colloidal magnesium aluminum silicate	Vander
Versene 100 Chelating Agent	Solution of tetrasodium salt of EDTA	Dow
Versene Acid	EDTA	Dow
Versene Powder	EDTA	Dow

RAW MATERIAL	CHEMICAL DESCRIPTION	SOURCE
Vista LPA Solvent		Vista
Witcamide 511	Alkanolamide surfactant (100% active)	Witco
Witcolate A Surfactant	Sodium laurylsulfate. Anionic.	Witco
Witconate K Surfactant	Sulfonated surfactant	Witco
Witconate 1250 Emulsifier	Sulfonated surfactant	Witco
Witconate 1260	C-12 LAS (60%)	Witco
Yarmor 302	Pine oil	Hercul
Zeolex 23-1 Silica	Silica pigment	Huber
Zeolex 23A	Silica pigment	Huber
200 Silicone Fluid (350 cs)		DowCor
200 Silicone Fluid (1,000 cs)		DowCor
200 Silicone Fluid (10,000 cs)		DowCor
200 Silicone Fluid (60,000 cs)		DowCor

Section IV
Suppliers' Addresses

Akzo Chemicals, Inc.
300 S. Riverside Plaza
Chicago, IL 60175
(312)-906-7500/(800)-257-8292

Alcolac, Inc.
Rhone-Poulenc
3440 Fairfield Rd.
Baltimore, MD 21226
(800)-848-7659

Allied-Signal, Inc.
P.O. Box 2332R
Morristown, NJ 07962
(201)-455-2000/(800)-526-0717

Aqualon
P.O. Box 15417
2711 Centreville Rd.
Wilmington, DE 19850
(302)-996-2000/(800)-345-8104

Arizona Chemical Co.
1001 E. Business Hwy 98
Panama City, FL 32401
(904)-785-6700/(800)-526-5294

Bareco Division
Petrolite Specialty Polymers
6910 East 14th St.
Tulsa, OK 74112
(800)-331-5516

BASF Corp.
100 Cherry Hill Rd.
Parsippany, NJ 07054
(201)-316-3000/(800)-526-1072

Burlington Chemical Co., Inc.
P.O. Box 111
615 Huffman Mill Rd.
Burlington, NC 27215
(919)-584-0111/(800)-672-5888

Ciba-Geigy Corp.
7 Skyline Drive
Hawthorne, NY 10532
(914)-347-4700/(800)-431-1900

Concord Chemical Co., Inc.
17th and Federal Sts.
Camden, NJ 08105

Degussa Corp.
65 Challenger Rd.
Ridgefield Park, NJ 07660
(201)-641-6100

Dow Chemical Co.
Midland, MI 48674
(800)-258-CHEM

Dow Corning Corp.
Box 0994
Midland, MI 48686
(517)-496-4000

Engelhard Corp.
101 Wood Ave.
Iselin, NJ 08830
(908)-205-5000

Exxon Chemical Americas
1012 Terra Drive
Milton, WI 53563
(608)-868-6811/(800)-441-0708

GAF Chemicals Corp.
Rhone-Poulenc
1361 Alps Rd.
Wayne, NJ 07470
(201)-628-3000/(800)-848-7659

GE Silicones
260 Hudson River Rd.
Waterford, NY 12188
(518)-237-3330/(800)-255-8886

B.F. Goodrich Co.
9911 Brecksville Rd.
Brecksville, OH 44141
(216)-447-5000/(800)-331-1144

W.R. Grace & Co.
55 Hayden Ave.
Lexington, MA 02173
(617)-861-6600

Hercules, Inc.
Hercules Plaza
Wilmington, DE 19894
(800)-247-4372

Hoechst Celanese Corp.
5200 77 Center Drive
Charlotte, NC 28217
(704)-559-6000/(800)-365-2436

J.M. Huber Corp.
One Huber Rd.
Macon, GA 31298
(912)-745-4751/(800)-637-8176

ICI Specialties
Concord Pike & New Murphy Rd.
Wilmington, DE 19897
(302)-886-3000/(800)-822-8215

Inolex Chemical Co.
Jackson & Swanson Sts.
Philadelphia, PA 19148
(215)-271-0800/(800)-521-9891

Johns-Manville
Ken-Caryl Ranch
Denver, CO 80217

Kaopolite, Inc.
2444 Morris Ave.
Union, NJ 07083
(908)-789-0609

Kelco
Div. of Merck & Co., Inc.
8355 Aero Dr.
San Diego, CA 92123
(619)-292-4900/(800)-535-2656

Kerr-McGee Chemical Corp.
Kerr-McGee Ctr.
P.O. Box 25861
Oklahoma City, OK 73125
(405)-270-1313/(800)-654-3911

Lonza, Inc.
1717 Rte. 208
Fair Lawn, NJ 07410
(201)-794-2400/(800)-777-1875

Miranol Inc.
Rhone-Poulenc
South Brunswick, NJ 08810
(201)-329-3900/(800)-848-7659

Mona Industries Inc.
76 E 24 St.
P.O. Box 425
Paterson, NJ 07544
(201)-345-8220/(800)-553-6662

Monsanto Co.
800 N. Lindbergh Blvd.
St. Louis, MO 63167
(314)-694-1000/(800)-325-4330

Morton International Inc.
100 N. Riverside Plaza
Chicago, IL 60606
(312)-807-2000/(800)-367-3318

Niacet Corp.
47 St. & Niagara Falls Blvd.
Niagara Falls, NY 14304
(716)-285-1474/(800)-828-1207

Olin Chemicals
Olin Corp.
120 Long Ridge Rd.
P.O. Box 1355
Stamford, CT 06904
(203)-356-2000/(800)-243-9171

Pennsylvania Glass Sand
ITT System
3 Penn Center
Pittsburgh, PA 15235

Pilot Chemical Co.
11756 Burke St.
Santa Fe Springs, CA 90670
(310)-723-0036

PMC Specialties Group
20525 Center Ridge Rd.
Rocky River, OH 44116
(216)-356-0700

PPG Industries
Chemicals Group
One PPG Place
Pittsburgh, PA 15272
(412)-434-3131/(800)-243-6774

PPG/Mazer Chemicals
3938 Porett Drive
Gurnee, IL 60031
(312)-244-3410/(800)-CHEM-PPG

PQ Corp.
P.O. Box 840
Valley Forge, PA 19482
(215)-293-7200

Rheox, Inc.
P.O. Box 700
Hightstown, NJ 08520
(609)-443-2500

Riverside Products Corp.
P.O. Box 729
Cartersville, GA 30120
(706)-386-3115

Rohm & Haas Co.
Independence Mall West
Philadelphia, PA 19105
(215)-592-3000

Sandoz Chemicals Corp.
4000 Monroe Rd.
Charlotte, NC 28205
(704)-331-7078/(800)-631-8077

Shell Chemical Co.
P.O. Box 2463
Houston, TX 77252
(713)-241-6161

Sherex Chemical Co., Inc.
5777 Frantz Rd.
P.O. Box 646
Dublin, OH 43017
(614)-764-6500/(800)-366-6500

Stepan Co.
22 W. Frontage Rd.
Northfield, IL 60093
(708)-446-7500/(800)-745-7837

SWS Wacker Silicones Corp.
3301 Sutton Rd.
Adrian, MI 49221
(517)-264-8500/(800)-248-0063

Texaco Chemical Co.
3040 Post Oak Blvd.
Houston, TX 77056
(713)-961-3711

3M
3M Center
Bldg. 223-6SE
St. Paul, MN 55144
(612)-733-5454

Union Carbide Corp.
39 Old Ridgebury Rd.
Danbury, CT 06817
(203)-794-2000

R.T. Vanderbilt Co., Inc.
P.O. Box 5150
30 Winfield St.
Norwalk, CT 06856
(203)-853-1400/(800)-243-6064

Vista Chemical Co.
P.O. Box 19029
900 Threadneedle
Houston, TX 77224
(713)-588-3000/(800)-231-8216

Witco Corp.
520 Madison Ave.
New York, NY 10022
(212)-605-3941/(800)-238-9150

Other Noyes Publications

ADVANCED CLEANING PRODUCT FORMULATIONS

Household, Industrial, Automotive

Volume 1

by

Ernest W. Flick

This book presents **more than 800 up-to-date advanced cleaning product formulations** for household, industrial and automotive applications. It is the result of information received from numerous industrial companies and other organizations. The data represent selections made at no cost to, nor influence from, the makers or distributors of these materials. Only the most recent formulas have been included. It is believed that all of the trademarked raw materials listed here are currently available.

The formulations in the book are divided as follows. Parenthetic numbers indicate the number of formulations in each chapter.

I. HOUSEHOLD/INDUSTRIAL CLEANERS

1. **Bathroom Cleaners (16)**
2. **Disinfectants (11)**
3. **Dishwashing Detergents (57)**
4. **Floor Cleaners and Wax Strippers (41)**
5. **General Purpose Cleaners (73)**
6. **Laundry Products (143)**
7. **Metal Cleaners (74)**
8. **Oven Cleaners (10)**
9. **Rinse Additives and Aids (97)**
10. **Rug, Carpet and Upholstery Cleaners and Shampoos (41)**
11. **Wall and Hard Surface Cleaners (52)**
12. **Window and Glass Cleaners (25)**
13. **Miscellaneous Cleaners (130)**

II. AUTOMOTIVE CLEANERS

14. **Car and Truck Washes (48)**
15. **Whitewall Tire Cleaners (8)**
16. **Miscellaneous Cleaners (22)**

Each formulation in the book lists the following information, as available, in the manufacturer's own words:

- Description of end use and most outstanding properties.
- The percent by weight or volume of each raw material included in the formula, rounded to a decimal figure.
- Key properties of the formula, which are the features that the source considers to be more outstanding than other formulations of the same type.
- The formula source, which is the company or organization that supplied the formula. The secondary source may be the originating company and/or the primary source's publication title, or both. A formula number is included, if applicable.

In addition to the sections listed above, there are two other sections which will be helpful to the reader:

III. A chemical trade name section where trade-named raw materials included in the book are listed with a brief chemical description and the supplier's name. The specifications which each raw material meets are included, if applicable.

IV. Main office addresses of the suppliers of trade-named raw materials.

ISBN 0-8155-1186-8 (1989) 6"x9" 372 pages